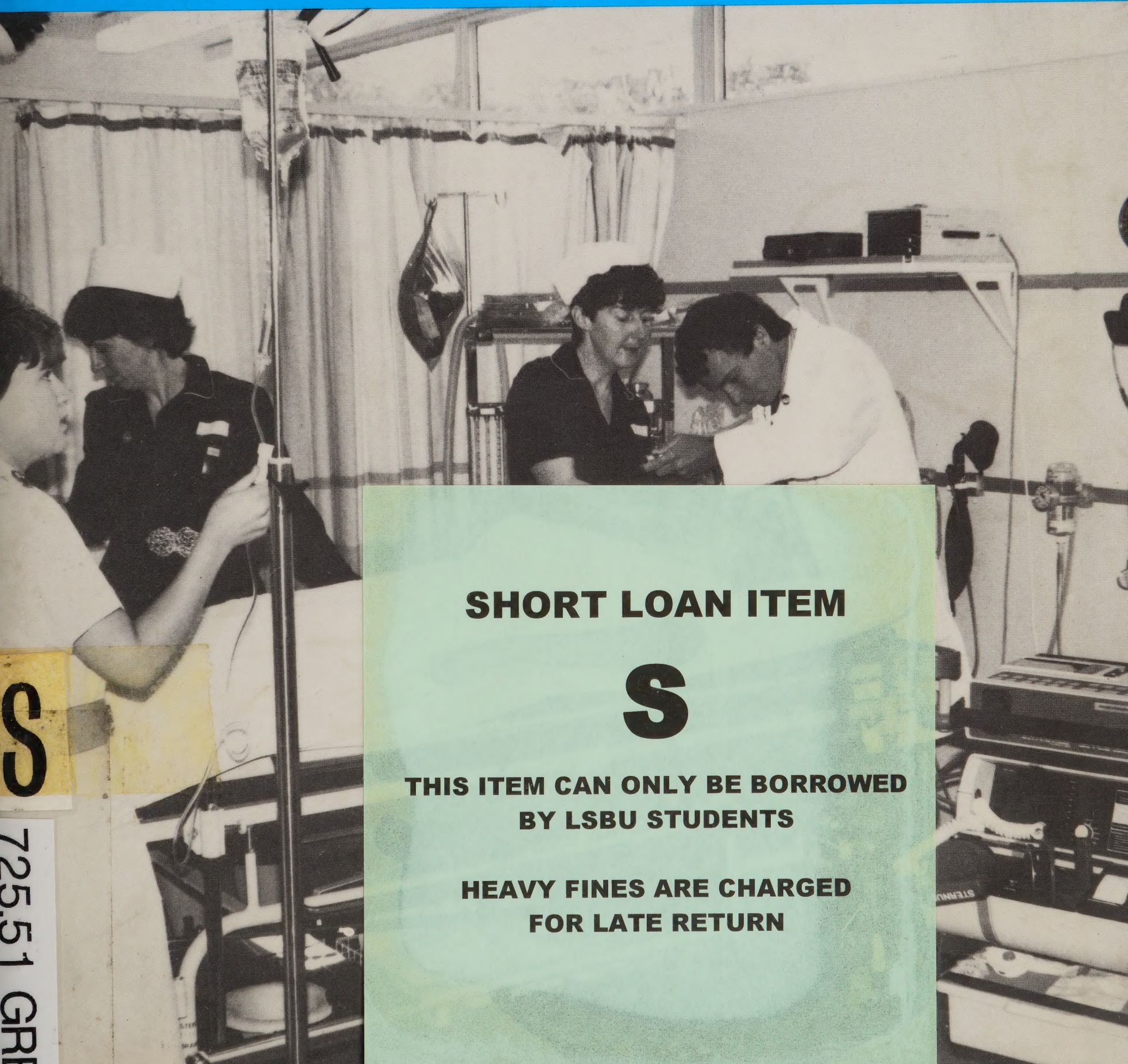
MC107

HEALTH BUILDING NOTE 22

Accident and Emergency Department

DEPARTMENT OF HEALTH
and the WELSH OFFICE



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Health Building Notes: Preface

Health Building Notes (HBNs) are intended to assist those involved in the briefing and design stages of schemes to provide new health buildings or to adapt or extend existing premises. The Notes contain information on relevant aspects of service objectives, functional requirements, and design. They establish standards of accommodation that are consistent with the functional requirements and form the basis for deriving Cost Allowances.

The functions, activities, equipment, environmental conditions, engineering services, and dimensions which are critical to the efficient performance of an activity, are identified and discussed but no preference for any particular configuration or plan is implied. Optional solutions with cost implications are indicated, where appropriate, leaving local planners to make their own choices.

Reference is made in the Notes to the related Design Briefing System and also to Activity Data sheets which provide the detailed user requirements for each room or space.

Guidance on spaces common to all health buildings has been brought together in HBN 40* 'Common Activity Spaces', to which reference is made where appropriate in each Note.

HBNs are prepared in consultation with representatives of the National Health Service and appropriate professional bodies.

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*HBN 40 –
- Volume 1 – Clinical, Sanitary, Administrative and Associated Spaces
- Volume 2 – Corridors
- Volume 3 – Lifts and Stairways } in preparation
- Volume 4 – Designing for Disabled People } in preparation

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1 Scope of Health Building Note

Introduction

1.1 This building note replaces Hospital Building Note 22 (published February 1964, reprinted with amendments in 1969) and provides guidance for building Accident and Emergency Departments which have total attendances from 10,000 to 70,000 per annum. Accommodation for total attendances above this figure can be calculated by extrapolation from the 70,000 size.

1.2 This building note takes account of the needs of A and E Departments staffed and equipped to deal with major and minor injuries and illnesses for varying workloads. The guidance also gives the latest thinking on the design of these Departments. It is intended to facilitate good management in order to achieve a higher patient throughput, a shorter length of stay and lower running costs. Every care has been taken to ensure that the Departmental Cost Allowances for this accommodation are as economical as possible without detriment to clinical service standards. It includes guidance for the needs of small or rural hospitals which will still be required for geographical reasons, or to cope with seasonal fluctuations in populations, as has been expressed in the Fourth Report from the Expenditure Committee, Volume 1.

1.3 The A and E Department must cope with a complex mix of social and medical factors in emergency situations all day every day of the year. Adaptability of reception space and facilities, the provision of adequate space for treatment, and the ready access to supporting facilities are all vital for the efficient running of an Accident and Emergency Department regardless of its size.

1.4 Project teams involved in the upgrading or planning of new A and E Departments must seek the advice of medical, nursing, administrative and other staff experienced in the management of A and E services.

1.5 The guidance in this Note covers five sizes of A and E Department relating to the majority of hospitals which provide for the following number of total attendances:

a. 10,000
b. 20,000
c. 30,000
d. 50,000
e. 70,000.

1.6 Fracture clinics are not included in this Note. Separate Building Note guidance is being considered.

Cost allowances

1.7 The Cost Allowance associated with this HBN is promulgated in an Annex to the Health Notice that issued the Advance Copy of the Note. The room areas in the Schedule in the Cost Chapter are those used in preparing the Cost Allowance. They may be used as a guide in preliminary planning, but must under no circumstances be treated as a maximum or as an entitlement. This is dealt with more fully in the Cost Chapter (Chapter 7).

Capricode

1.8 Capricode is the mandatory procedural framework governing the inception, planning, processing and control of individual health building schemes. The aim of Capricode is to promote a consistent and streamlined approach to capital development that achieves best use of resources through the selection and construction of relevant and cost effective schemes that open on time and within budget. It identifies the main activities and provides a framework for delegation with effective management and the proper accounting for expenditure and performance. (See 'Capricode Health Building Procedures' issued to Health Authorities with HN(86)32).

Design Briefing System (DBS)

1.9 The DBS is a series of notebooks which are used in conjunction with new or revised building notes to help specify user requirements for a Design Brief. Each notebook adopts a check-list approach, providing a framework which guides the project team through the consideration of organisational and planning options, and leads to a list of activity spaces. Although the application of DBS is confined mainly to planning new facilities, it can be used also to prepare a brief for extensive upgrading of existing accommodation. Health Building Notes published by HMSO are accompanied by the relevant DBS notebook. Further information about DBS can be obtained from Room 503 Euston Tower, 286 Euston Road, London NW1 3DN (tel: 01–388 1188 ext 3590).

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2 General Service Considerations

Service provided and major functions

2.1 A and E Departments provide a service (at major units on a 24 hour/seven days a week basis) primarily for the reception, assessment, examination and treatment of patients who have been involved in an accident, or have sustained an injury, or who have an acute surgical or medical emergency.

2.2 The four main sources of referral to the A and E Department comprise:

a. self referral
b. ambulance referral
c. general practitioner referral
d. industrial referral.

Only about 20% of patients who attend are seriously ill or have suffered from major trauma. The remainder have a variety of conditions, such as wounds, abscesses, septic hands and minor eye injuries, and some have undiagnosed medical conditions which may or may not eventually turn out to be serious, some perhaps requiring admission.

2.3 Whatever the reasons for the referrals to A and E Departments, the first time attendance numbers are outside the Department's control and have to be taken into account when assessing work-load. Nationally, about 30% of all attendances at A and E Departments are patients returning for follow-up treatment. The proportions will depend on local policy on re-attendance which will also be linked with referral to general practitioners and to out-patient clinics. The local policy on such matters will affect the work-load for the A and E Department and must be taken into account when assessing the likely work-load.

2.4 Facilities are required to deal with stretcher patients, those who are critically ill and require resuscitation, patients suffering from alcohol or drug over-dosage, those with suspected or confirmed fractures and those with minor injuries.

2.5 As a significant proportion of the patients attending an A and E Department will be children, their special needs should be taken into account. These should be met by the provision of separate waiting areas or special furnishings or fittings in cubicles or rooms likely to be used by children.

Notified admissions

2.6 Surgical and medical emergency admissions from General Practitioners are usually admitted direct to the appropriate in-patients accommodation. Where, because of local policy, these ill patients are admitted through the A and E Department, additional facilities and staff must be available within that Department.

Heralded emergencies

2.7 The policy of the hospital with respect to patients accepted for admission as emergencies from General Practitioners will also greatly affect the A and E Department. Patients admitted as emergencies from General Practitioners are often very ill and, as they are usually accepted for admission by staff who are not actually attached to the A and E Department, clear-cut policies need to be established for their reception and care. In some hospitals it is the practice for all such patients to be admitted through the A and E Department, and additional facilities will be needed for this purpose. At night all emergency admissions may be admitted to observation beds provided for A and E patients until more permanent accommodation can be found for them.

2.8 The A and E Department must frequently deal with life threatening emergencies. There must be a resuscitation room appropriately equipped, on the stretcher route within the Department.

2.9 Most hospitals have contingency plans for major incidents involving multiple casualties, and it is normal for the A and E Department to be the organisational focus for the implementation of such plans. It is important to provide adequate storage for the equipment, etc associated with the requirement for dealing with a major incident.

Treatment facilities

2.10 Accident and emergency patients who require major surgery will be treated in the main operating department. Facilities for some operative procedures should be available in suitable major treatment rooms, which provide a controlled clinical environment. Operating theatres are therefore not required in the A and E Department; where they have been provided in the past there is evidence of under-utilisation or misuse.

Contagious diseases and contamination by radioactive material

2.11 Patients suffering from highly contagious or infectious diseases who attend A and E Departments may present a hazard to others. It is unlikely that the clinical diagnosis will be made before the patient is examined by a doctor in that Department. However, it will be obvious that some patients need to be isolated and a room, near the entrance to the Department, should be provided.

2.12 Some patients will need to be cleansed, possibly before any further examination can take place. A room will be needed for the cleansing of patients who are infested with vermin or whose clothing has been contaminated by excessive soiling or injurious chemicals. (See paragraph 4.9).

2.13 Where there is a particular hazard from patients arriving at the A and E Department with an infectious disease (eg from a nearby major airport), specialist microbiologist advice should be sought. Consideration needs to be given to the way in which the appropriate accommodation is provided. Such accommodation is not included in this Note.

2.14 Exceptionally, if it is considered locally that contamination by radioactive material or chemicals is a particular hazard, guidance should be sought from the Health and Safety Executive and Radiation Protection Adviser.

The apparently dead

2.15 Local policy should be taken into account regarding the necessity for dealing with patients thought to be dead on arrival at the hospital.

Observation and recovery

2.16 Some patients attending A and E Departments will require a period of intensive observation whilst being assessed or following treatment; others will need to recover before being discharged home. Project teams should note that these patients will have been seen by a doctor and are usually observed because their diagnosis or condition is uncertain. Such patients should be regarded as being very ill, even if they apparently show no symptoms. Facilities provided for their observation and resuscitation should be designed accordingly.

2.17 The way in which observation beds are provided, where they are located and how they are used by the A and E Department, will require careful consideration by project teams and must be governed by clearly defined local operational policies. An additional adult acute ward should be set aside for this purpose; it may be convenient also to designate this ward for emergency admissions, particularly at night. Patients who need to remain for a short time recovering on trolleys should be accommodated in a curtained recovery bay in the A and E Department.

Radiological examinations

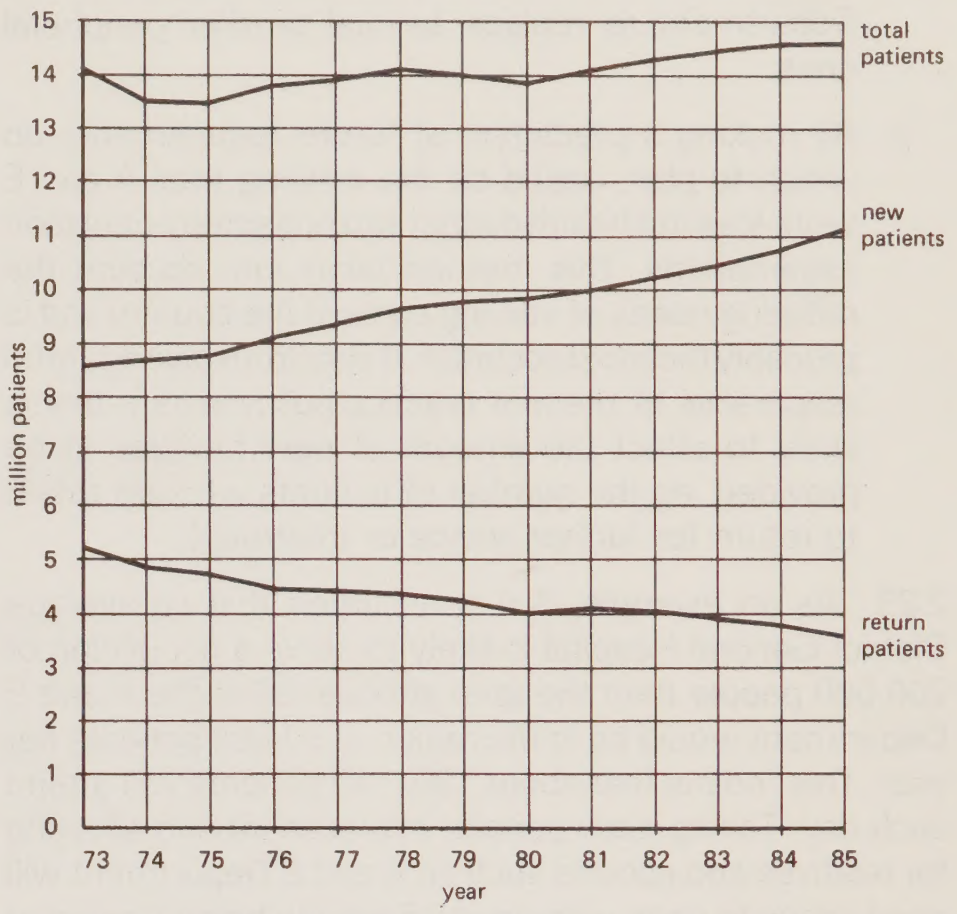
2.18 Many patients who attend A and E Departments are in need of radiological examinations. A significant number of these are very ill and in need of continuing medical and nursing care while they are being investigated. Consequently the planning relationship between the A and E Department and the Radiodiagnostic Department is important, and the departments should be sited immediately adjacent to each other. Reference should be made to Health Building Note 6 Radiodiagnostic Department.

Workload

2.19 Statistics demonstrate that the number of new patients attending A and E Departments in England and Wales has been increasing for many years. However the total attendances have remained more or less constant because the number of return patients has decreased (See graph).

2.20 For planning purposes, the number of total attendances should be used in calculating the size of an A and E Department. This assumed space is required for both new patients and the estimated proportion of patients who are asked to return for further treatment.

ACCIDENT AND EMERGENCY PATIENTS ATTENDANCES 1973 – 1985
FOR ENGLAND AND WALES



2.21 The sizes of A and E Department listed in paragraph 1.5 are derived from analysis of SH3 statistics (1982) which showed distribution of existing A and E Departments by total attendances.

Distribution of A and E Departments by Total Annual Attendances
England and Wales: 1982

Size — Annual Attendances	*Major Units*		*Peripheral Units*		*Total All Units*	
	Number	*%*	*Number*	*%*	*Number*	*%*
Under 15,000	16	6.2	354	87.0	370	55.6
15,000–25,000	30	11.6	37	9.1	27	10.1
25,000–45,000	104	40.3	16	3.9	120	18.0
45,000–65,000	69	26.7	—	—	69	10.4
65,000–85,000	23	8.9	—	—	23	3.4
Above 85,000	16	6.0	—	—	16	2.4
	258		407		665	

2.22 There are three methods of attempting to assess the work-load of an A and E Department. Local factors will determine how these may be used. The methods are:

a. By a peak period or periods. The size of the Department is determined by the need to cope with the maximum number of patients over any three-hour period during the day. Use of this method is not very accurate and tends to lead to over-provision and under-utilisation of resources. A recent Study* has confirmed this.

***The Use of Resources in Accident and Emergency Departments, Final Report. DHSS Commission (1984).**
Medical Architecture Research Unit.

b. By the health district catchment population. Use of this method can result in under-provision, particularly if the intention is to build a new centralised A and E Department to replace several smaller peripheral ones.

c. By making a prediction of future requirements on which to plan, based on the existing total A and E work-load in a health district and projected population assumptions. This method takes into account the differing needs of varying parts of the country and is probably the most accurate. It should involve a careful reappraisal of present practice/policy where this is likely to affect the amount of new facilities to be provided, eg the number of patients who are asked to return for further advice or treatment.

2.23 As an example, if it is assumed that an average District General Hospital is likely to serve a population of 200,000 people then the total attendance at the A and E Department would be in the region of 50,000 patients per year. This means that about 120–140 patients will attend each day. Taking peak periods into account and allowing for relatives and escorts such an A and E Department will need space to cope with up to 15 people being treated at any one time and about 30–40 people waiting, including escorts.

Major incidents

2.24 The operational policies for dealing with major incidents need to be determined (in accordance with HC(77)1) (in Wales, WHC(77)10) so that the possible use of adjoining departments or other spaces can be identified at early planning stages should the A and E Department be required to deal with an influx of patients from a major incident.

Organisation

2.25 A typical organisational pattern for a medium sized A and E Department for a District General Hospital catering for a population of 200,000–300,000 people is described here. The actual organisation of any department will however be dictated by many local factors and may be subject to seasonal variations. For the purposes of this Building Note it is assumed that the A and E Department will be open and appropriately staffed for 24 hours per day throughout the year.

2.26 The single over-riding organisational factor in any A and E Department is that it must at all times be ready to provide emergency treatment for any patient who attends. The arrival of a patient by ambulance is an unreliable indicator of the degree of emergency. Care should be taken in the design of the department to ensure that ambulant patients who are waiting can be seen by staff and are not isolated because some of them may be very ill and may not be able to communicate their needs.

2.27 During the day and at known busy periods it is common practice for one or more doctors to be based in the department, with perhaps other doctors on call.

2.28 The location of observation beds has been mentioned in paragraph 2.17 and this may significantly affect the organisation of the A and E Department. Observation beds, however provided, are used in various ways:

a. as a place where patients about whose condition there is concern are kept under intensive observation. These would include for example patients who have sustained a head injury, and although conscious may rapidly develop signs of an intracranial lesion;

b. for patients who require a short period of recovery following the accident, or an anaesthetic;

c. as a place where additionally all emergency admissions, except children, are received, particularly at night.

Patient flow

2.29 The organisation of individual departments will vary, but in many, patients are separated into streams which normally consist of:

a. Those patients deemed to be seriously ill, requiring immediate attention, and who are taken upon entry into appropriate treatment areas such as the resuscitation room, where documentation and reception procedures are undertaken, perhaps while treatment is actually in progress.

b. Patients who do not require immediate attention.

c. Patients who can sit and wait for attention.

This streaming is often described as 'triage'.

2.30 There are two methods of working:

a. The patients are called to treatment/examination areas where they are examined by a doctor, the so called 'doctor to patient' method.

b. The patients are sequentially seen by a doctor who stays in one place, the so called 'patient to doctor' method. It is frequently convenient to allow for both of these methods to be used and the design of the department should not preclude operation in either way.

2.31 Having been seen by a doctor the patient follows one of several courses depending on the diagnosis:

a. The patient is admitted as a surgical or medical in-patient (common examples of such cases being perforated peptic ulcer, trauma victims, patients suffering from coronary thrombosis, etc).

b. The patient is treated and kept under observation in the A and E Department or in an observation ward. Such patients include those who need to be observed while recovering from the effects of such conditions as trauma, head injuries, drug and alcohol overdose.

c. The patient has further investigations before treatment in the A and E Department eg radiodiagnostic examinations.

d. The patient may be treated and discharged after minor procedures such as the suturing of lacerations, or removal of foreign bodies from the eyes, the initial treatment of certain fractures, and the diagnosis and treatment of non-life threatening conditions.

e. Patients brought in dead and those who have died in the Department will be taken to the mortuary following certification of death.

2.32 Diagram 1 indicates the broad aspects of patient flow.

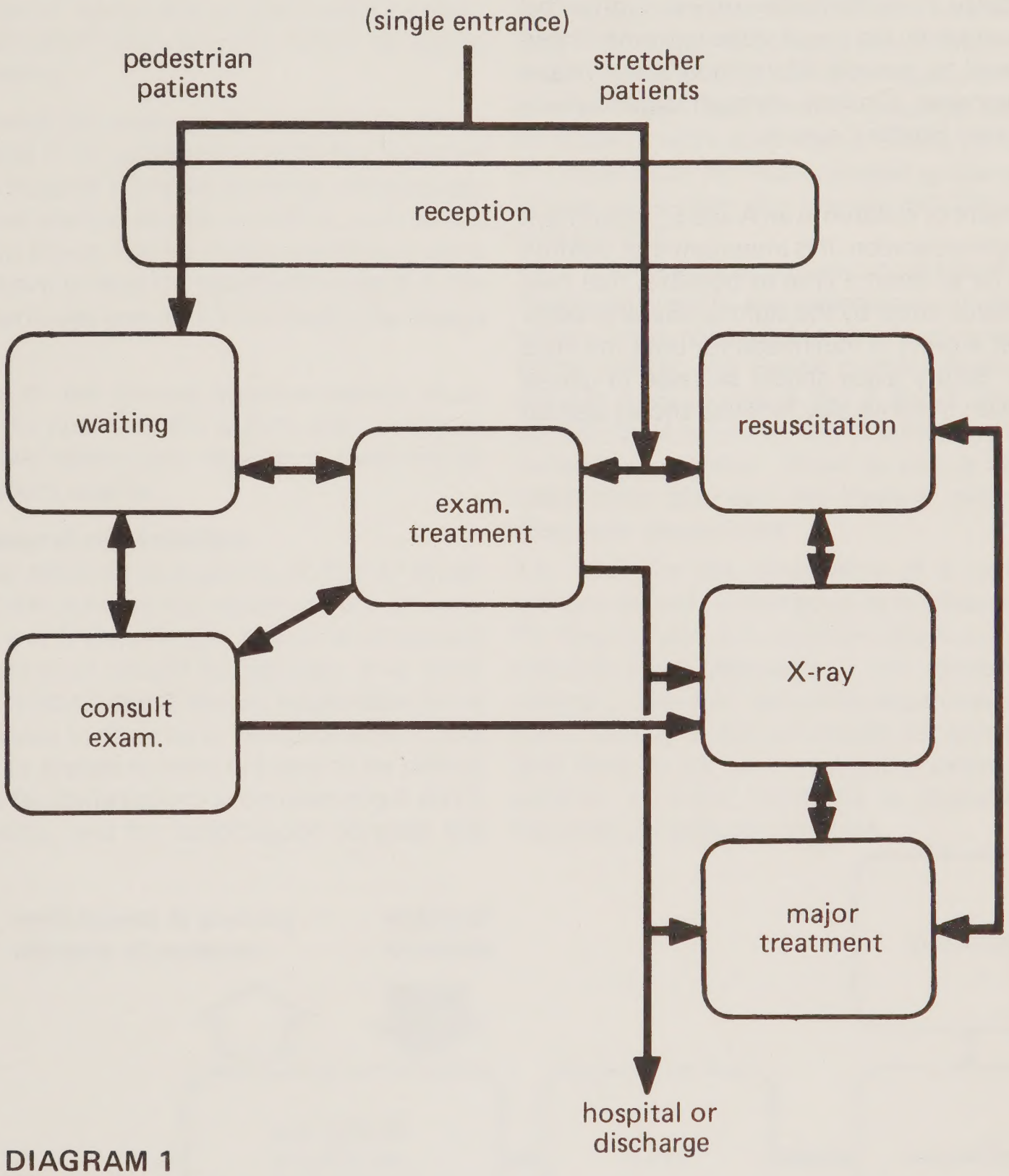


DIAGRAM 1
Flow of Patients

Waiting

2.33 It is inevitable that patients and their escorts will need to wait for varying lengths of time in the A and E Department. Well-established procedures, with adequate space properly planned in logical sequence corresponding to departmental needs, proper relations and communications, will all assist in reducing the time patients have to wait.

2.34 Anxiety of patients and their escorts when having to wait can be reduced by restful design of the department and by good organisation, which includes ensuring that patients are kept fully and continuously informed of reasons for any delay. This information may be both verbal and visual, for example by the use of video systems. These could also be used to provide information about health education and services available through organisations such as Community Health Councils.

Children

2.35 The treatment of children in an A and E Department requires special consideration. It is important that children are kept waiting for as short a time as possible, that they are not unnecessarily upset by the sight or sound of other patients, and that anxiety is minimised for both the child and the parents. Safety glass should be used in glazed areas. The provision of some play facilities should also be considered.

3 General Functional and Design Requirements

Introduction

3.1 This Chapter provides design guidance based on the service objectives outlined in Chapter 2, and includes information on a range of topics and environmental matters which should be taken into account when designing A and E Departments.

3.2 Account should be taken of the fact that for many patients the A and E Department is their first point of contact with the hospital. Patients and their relatives are likely to be anxious and the design should be such as not to increase patient stress. It is inevitable that from time to time people will have to wait for significant periods in the department, so particular care should be paid to the design of waiting areas.

3.3 The design of the clinical accommodation must reflect the need to preserve the dignity and privacy of patients, particularly where men and women are nursed or treated in adjacent spaces.

Location and general relationships

3.4 Patients may arrive by ambulance, on foot or by car and because of the emergency nature of the service, access to the A and E Department has to be at ground floor level. The entrance should be separate from other entrances to the hospital and it should be possible for at least two ambulances to draw up at the same time. There should be space to enable at least ten cars to be parked near the entrance for some escorts accompanying A and E Department patients, and for handicapped persons and certain A and E Department staff. These car parking spaces should not impede ambulances unloading and waiting areas. There should be an external canopy at the entrance in case of inclement weather. At a few hospitals patients may arrive regularly by helicopter. Consideration will have to be given to landing facilities required when planning the layout of the hospital and its grounds. Reference should be made to HBN 45 'External works for health buildings' (in preparation) for more detailed guidance on helicopter landing sites. See also Circular HSC(IS)196, dated September 1975.

3.5 The A and E Department should ideally be sited immediately adjacent to the radiodiagnostic department. Only where this is not possible should consideration be given to the staffing and capital cost implications of providing suitable X-ray rooms in the A and E Department. Thus the locational requirements of both departments must be considered together. There is also a need for a close relationship between the fracture clinic and the radiodiagnostic department.

3.6 Beds for the observation of A and E Department patients should be located so as to allow easy access from the Department. It is important also to ensure the shortest practical travel distances to the intensive therapy unit, coronary care unit, operating department, and the blood bank. Access to the out-patient department or any other area likely to be used to accommodate an overflow of patients in major incidents is important. Diagram 2 indicates general relationships.

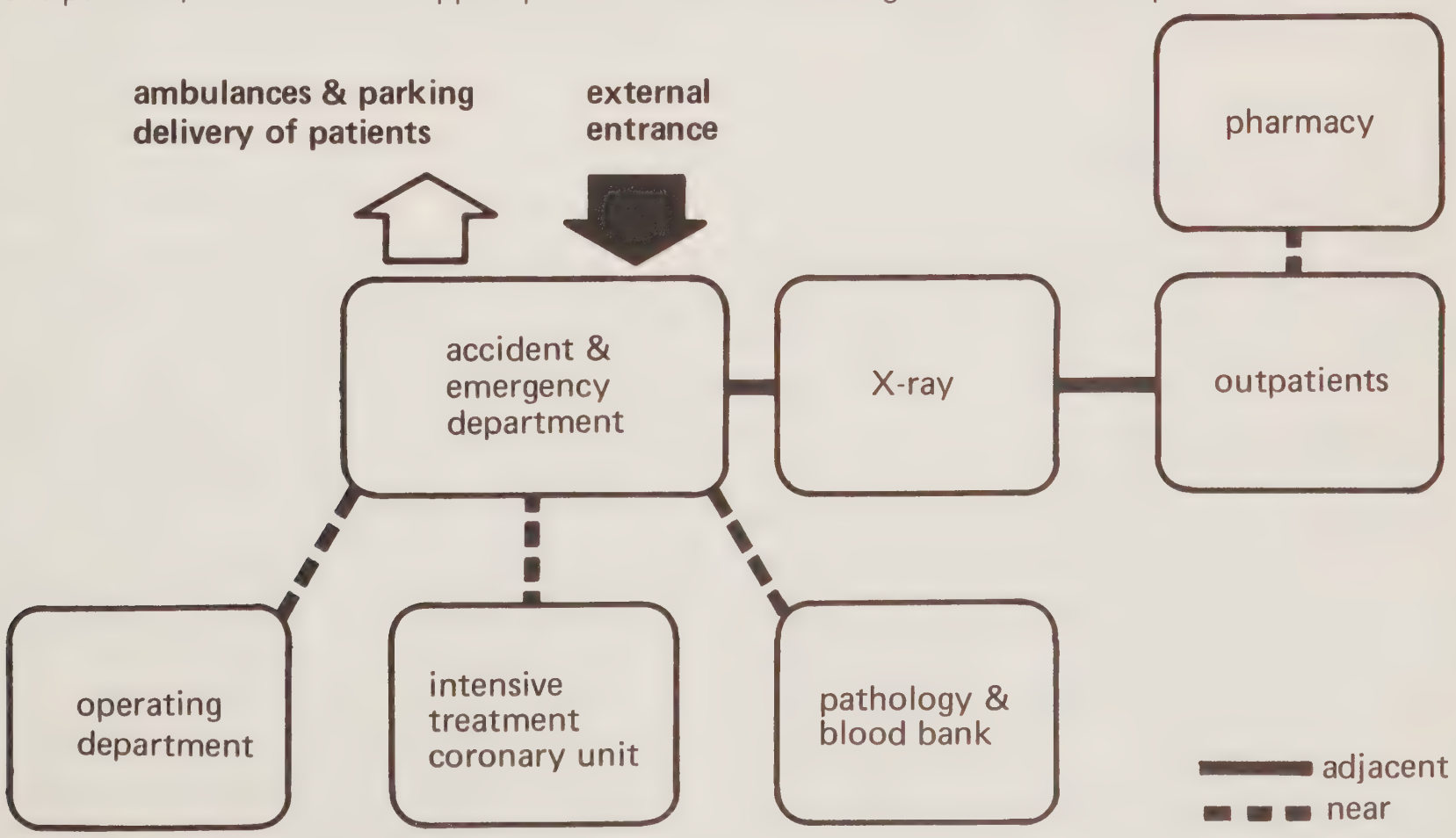


DIAGRAM 2
Internal & External Relationships

Signposting

3.7 HBN 40 'Common Activity Spaces (Volume 2) Corridors', and Health Technical Memorandum 65 'Signs' should be consulted for general guidance. The manual covers also the type of signboard on which the location of different meetings can be displayed.

3.8 The signs at the entrance(s) to the hospital grounds should be vandal proof and include 'ACCIDENTS' in red. The location sign(s) on the department itself should, ideally, be capable of being seen from the entrance(s) to the grounds. The department should be adequately signposted from the entrance(s); from the car-park, and from other strategic positions. All signs should be at a level which will prevent them from being obscured by cars and other vehicles, and should be illuminated after dark.

3.9 The reception point should be identified as 'Accidents reception'. Unless waiting areas and children's play areas are shut off and behind doors there should be no need for signs identifying them. Within the department, appropriate identity signs should be provided.

3.10 With regard to major incident signs (see paragraph 2.24) each designated hospital needs a kit of temporary signs which may be on folding frames. Alternatively, standard removable planks may be used, but if so temporary fixings should be provided. For individual rooms that may change their function in a major incident, holders should be provided on the door, to take signs such as Police, Press, Relatives and friends, Control room.

Staff facilities

3.11 The provision of suitable staff facilities is a contributory factor to the efficient functioning of an A and E Department. Because of the fluctuating nature of the work and situations of stress, it is essential to provide adequate rest facilities. These should comprise cloakroom and sanitary accommodation including a staff shower and doctors' overnight stay room which could also be used as a study. Adequate privacy for staff should be ensured by siting rest facilities away from the patient waiting areas.

Patient services

3.12 Space is required within the A and E Department for the storage of records normally for up to two years. The records themselves should be dealt with in accordance with an agreed local medical records policy; including the possible use of micro-computers in the reception area (see paragraph 4.5).

Catering and domestic services

3.13 Beverage facilities for staff unable to leave the A and E Department during busy periods should be provided in the staff rest room. Limited provision for beverages (eg vending machines) may be required in the Department for relatives and escorts. Patients awaiting treatment may require an anaesthetic: care should be taken therefore, to ensure that they do not consume beverages while waiting.

3.14 Extensive spillage, sometimes obnoxious, is only too common in the A and E Department and may occur at any time of the day or night. Staff on duty should always have immediate access to a small set of emergency 'cleaning up' materials and hand equipment separate from the departmental cleaning room, which should be checked and cleaned or replaced at least daily by a member of the domestic staff.

Supplies

3.15 The A and E Department has a fluctuating work-load with busy weekends. Supplies deliveries and storage will need to take this into account, particularly the replenishment of special sterile supplies and those items used infrequently. Storage for major incident emergency supplies is required including the facility for recharging portable electric equipment.

Violence and security

3.16 It is inevitable that some of those who attend A and E Departments will be violent. Such people present a potential hazard to both patients and staff, and the Department should be so designed that the hazard is minimised, eg by ensuring adequate observation and good communication. It should be borne in mind that violent behaviour is also a feature of several of the common clinical conditions which every A and E Department is regularly called upon to treat, and that some violent patients may require urgent and intensive care.

3.17 Whole hospital policies relating to the management of violence by patients or escorts have special relevance to A and E Departments. Consideration needs to be given to the provision of alarm systems in the A and E Department to alert other Departments such as the switchboard, porters or security. In some instances, eg within an inner city area, it may be necessary to provide a direct alarm link with the police station. Vandalism and theft of NHS property are other problems which must be guarded against.

3.18 There may be a need for security glass screens to be provided at reception for the protection of staff. In certain circumstances, it may be necessary to provide a separate security counter for the initial reception of patients, but the potential staffing and clinical implications will require careful consideration. Regarding violence, vandalism and theft, the entrance must be supervised from the reception area, while it is manned, to prevent people with no valid reason for entering the A and E Department from gaining access. At night, it may be necessary to lock the outside door and provide a bell push. Account may need to be taken of supervising the use of doors from the A and E Department to other parts of the hospital so as to prevent patients and relatives already in the Department from gaining unauthorised access to other hospital departments. This may require the temporary locking of doors, taking into account the need for safety measures such as fire precautions and means of escape.

3.19 The project team should discuss security with the officer in charge of the local Police Crime Prevention Department and the hospital or district security officer or adviser at an early stage in the design of the building. Fire and Security Officers should be consulted concurrently because the demands of security and fire safety may sometimes conflict. The attention of planners is drawn to Circular HN(84)26, dated December 1984, in Wales circular WHN(85)1, about Security, especially Chapter 9 and paragraphs 15.8 to 15.11 in the NHS Security Manual issued with the Circular.

Communications

3.20 The provision of an effective communications system is necessary for the efficient management of an A and E Department. When specifying systems, appropriate specialist advice should be sought and the emergency services consulted. Communications requirements can be considered in four main categories:—telephones and radio; intercom; patient/staff call; alarms.

3.21 *Telephones/Radio:* These will be provided in accordance with the whole hospital communications policy. In addition to the normal pbx telephone extensions, at least one ex-directory or direct line should be installed for communication with the emergency services. This instrument should be provided with a distinctive alarm bell or buzzer. It may be appropriate to provide a space for equipment so that direct radio communication with mobile vehicles can be made. Provision should be made for outlets to facilitate the use of additional telephones eg in event of major incidents. Public call boxes will be required in the main waiting area for use by patients and escorts.

3.22 *Intercom:* Communication is necessary between the staff within the A and E Department. This need may be satisfied by a simple-to-use intercom system. It contributes to the most effective use of staff by reducing the need for unnecessary or abortive movement throughout the department, provided it is simple to use and master intercom stations are installed in all key locations of greatest staff activity. This will accommodate a wide range of functions, both routine and emergency, when staff need to communicate rapidly or required assistance, such as:

a. The facility to locate a member of staff using an ALL CALL paging via all intercom stations or selected groups of stations, for example, to locate a doctor or senior nurse; also emergency calls for assistance in cases of clinical need or potentially violent incidents.

b. The facility to monitor activities in specific areas, for example — a nurse working alone in a treatment room could open a communication channel to a staff base which would enable her to call for assistance without leaving her patient.

c. Routine communications between two or more selected intercom stations.

Depending on local policy it may be appropriate to link the intercom systems with those in other departments, eg the diagnostic X-ray department or observation areas.

3.23 *Patient/Staff call:* In addition to intercom there is a need for patient-to-staff communication from WCs and recovery spaces within the department. The design solution should enable maximum observation of patients in the examination/treatment area. There is a need for a patient/staff call system to rooms where patients may be left occasionally unattended.

3.24 ***Security alarms:***

a. *Personal alarm transmitters:* Staff may carry personal alarm transmitters, which depending on local policies, will have special engineering implications.

b. *Fixed security alarms:* Where assistance is needed an alarm connected directly to the hospital switchboard or police station will be required to alert them in cases of violent incidents involving patients or escorts. The actuating switch or buttons of the fixed alarms should be located unobtrusively at the reception desk and staff base.

c. *Controlled Drugs cupboard:* Repeater indicator lights from the Controlled Drugs Cupboard should be provided at the staff base.

d. *Fire alarms:* These will be provided in accordance with hospital fire policy.

Planning and design

3.25 Shape and accessibility are characteristics which have significant effect on the flexibility and optimum use of space in the department. Space should be efficiently distributed between usable floor areas and circulation which should provide quick direct access to every space with the minimum amount of cross traffic. Special care should be taken to ensure that doors and corridors are wide enough to allow the passage of patient trolleys, wheelchairs and equipment. There needs to be adequate overhead clearance to allow the passage of tall equipment.

3.26 Whilst one aim should be compact planning, efforts should be made to provide maximum access to outside views and air, possibly by the use of internal courts. This could also lessen the dependence upon engineering solutions to the problems of environmental control.

3.27 Observation and privacy are important factors in the layout and design of the A and E Department. Staff should have a clear view of the entrances, waiting, examination/treatment spaces and of the observation/recovery area. Care should be taken to provide visual and/or auditory privacy to patients as appropriate. Children should not be exposed to the more disturbing aspects of patient care and should have a separate room within the general waiting area (paragraph 4.6). Wherever possible children should be examined and treated in rooms rather than cubicles.

3.28 The design should not be so rigid as to prevent the flexible use of the department or to inhibit changes because of alterations in organisation or the changing patterns of patient care.

3.29 In the event of a major incident more space will be needed to deal with patients and escorts. The location of the department should be such that it is possible to make use of adjoining space in such an event. In addition, to enable a larger concourse to be formed within the department, screens and furniture should be capable of being moved rapidly and easily away to form a large open space.

Internal environment

3.30 The internal environment of an A and E Department should reflect the needs of patients, their relatives and the staff. As far as possible waiting spaces should have natural light and ventilation, and be pleasant, well illuminated and cheerful especially in the parts used by children. An excessively clinical appearance should be avoided especially in the entrance areas. Soft pastel colours or small patterned wallpapers, wood furniture, some pictures and plants, and carpeted waiting areas would produce the desired effect

of calm reassurance and relaxation. It is also desirable to provide generous window areas overlooking planted outdoor spaces.

3.31 Clinical areas will need to reflect the demands placed upon them with the need for visual and/or auditory privacy being balanced against the need for observation. Individual space descriptions will indicate the privacy requirements. The resuscitation area will require similar environmental control to that of a major treatment room.

Ventilation

3.32 Natural ventilation is usually caused by the effect of wind pressure. It will also occur to some extent if there is a temperature difference between inside and outside the building. This thermo-convective effect frequently predominates when the wind speed is low and will be enhanced if there is a difference in height between inlet and outlet openings. Ventilation induced by wind pressure can promote high air change rates through a building if air is able to move freely within the space from windward to the leeward side of the building. Internal partitions, fire compartments walls and closed doorways can however often impede the flow path and when this happens the process will be more dependent on single-sided ventilation. Nevertheless, even with this degree of obstruction to air movement, acceptable ventilation may still be obtained without excessive window openings which could prejudice safety, security and comfort. Some types of windows, eg vertical sliding, can enhance single-sided air exchange by temperature difference and these will improve the overall rate of natural ventilation in protected or sheltered areas where the effect of wind pressure is likely to be minimal. Section 2.3 of HTM 55 'Windows' and BS 5925 — a Code of Practice for Design of Buildings — provides further guidance on this subject.

Lighting

3.33 A high standard of local lighting is required for many procedures such as the suturing of wounds and should be provided in all clinical areas (6.55). There should be a 'no break' supply in major treatment rooms. Supplementary lighting should be easily and readily available if necessary. Careful attention should be paid to levels of lighting both day and night, to the differences in lighting levels between adjacent spaces and between ambient space and work stations, and the need for dimming facilities where appropriate. There should be balanced colour corrected lighting in all clinical areas. Adequate external night lighting is needed. The lighting standards needed for major surgery are not usually required in an A and E Department.

Sound attenuation

3.34 A degree of sound attenuation is required throughout the area of the Department. This may call for solid walls, acoustic ceilings and carpeted floors where practicable.

4 Specific Functional and Design Requirements

Introduction

4.1 This chapter provides guidance on the functional requirements and design implications for each of the activity spaces within the Accident and Emergency Department. Diagrams 3 and 4 illustrate the room relationships and planning principles within the Department.

4.2 Activities, equipment, detailed environmental conditions and finishes of walls, floors and ceilings are given in the Activity Data sheets. Reference should also be made to the relevant Health Technical Memoranda covering Component Data (see paragraphs 5.31–5.34).

DESCRIPTION OF ACCOMMODATION

Entrance

4.3 This should be planned to enable clinical staff to allocate priorities on the basis of clinical need (paragraph 2.29). A single entrance for all categories of patients is recommended. It should be of sufficient dimensions to minimise congestion. It is essential to provide adequate space for easy movement of wheelchairs and stretcher trolleys.

4.4 There is need for a draught lobby and outside the entrance there should be a canopy which affords adequate weather protection for patients alighting from cars or ambulances. The canopy needs to be sufficiently high to clear lights and aerials on ambulances. The provision of

Ambulance and walking entrance protected with supported canopy

automatic opening doors for the streams of patients referred to in paragraph 2.29, offers considerable advantage to the movement of patients, particularly those on stretchers, or in wheelchairs. The lobby should be large enough to allow each set of doors to close before the next set opens. A water tap may be needed outside the Department's entrance to enable ambulance staff to undertake minor cleaning to the inside of their ambulance.

Reception

4.5 This should be located so that staff can clearly see both ambulant and stretcher patients entering the depart-

Ambulance entrance with cantilever canopy

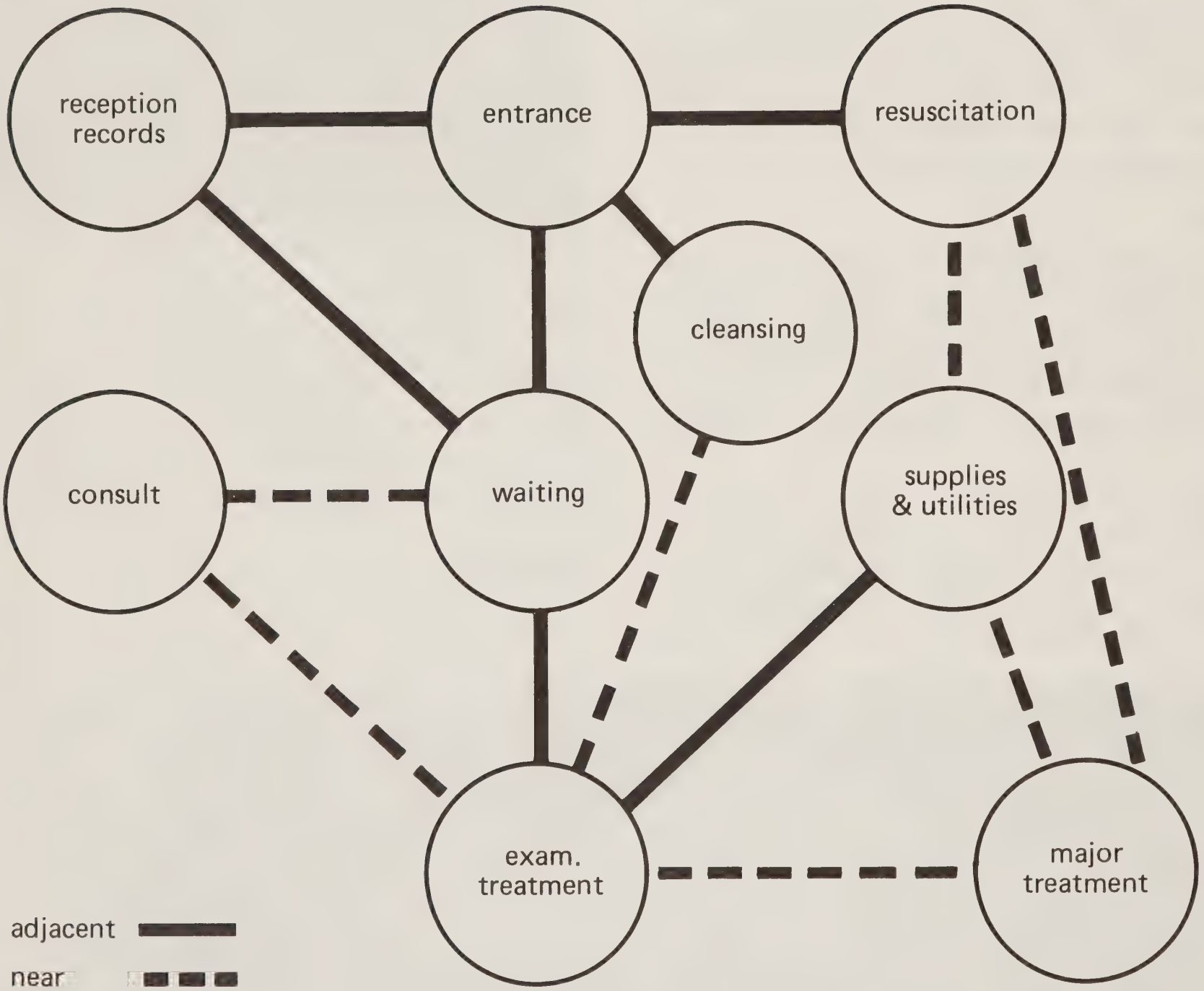


DIAGRAM 3
Room Relationships

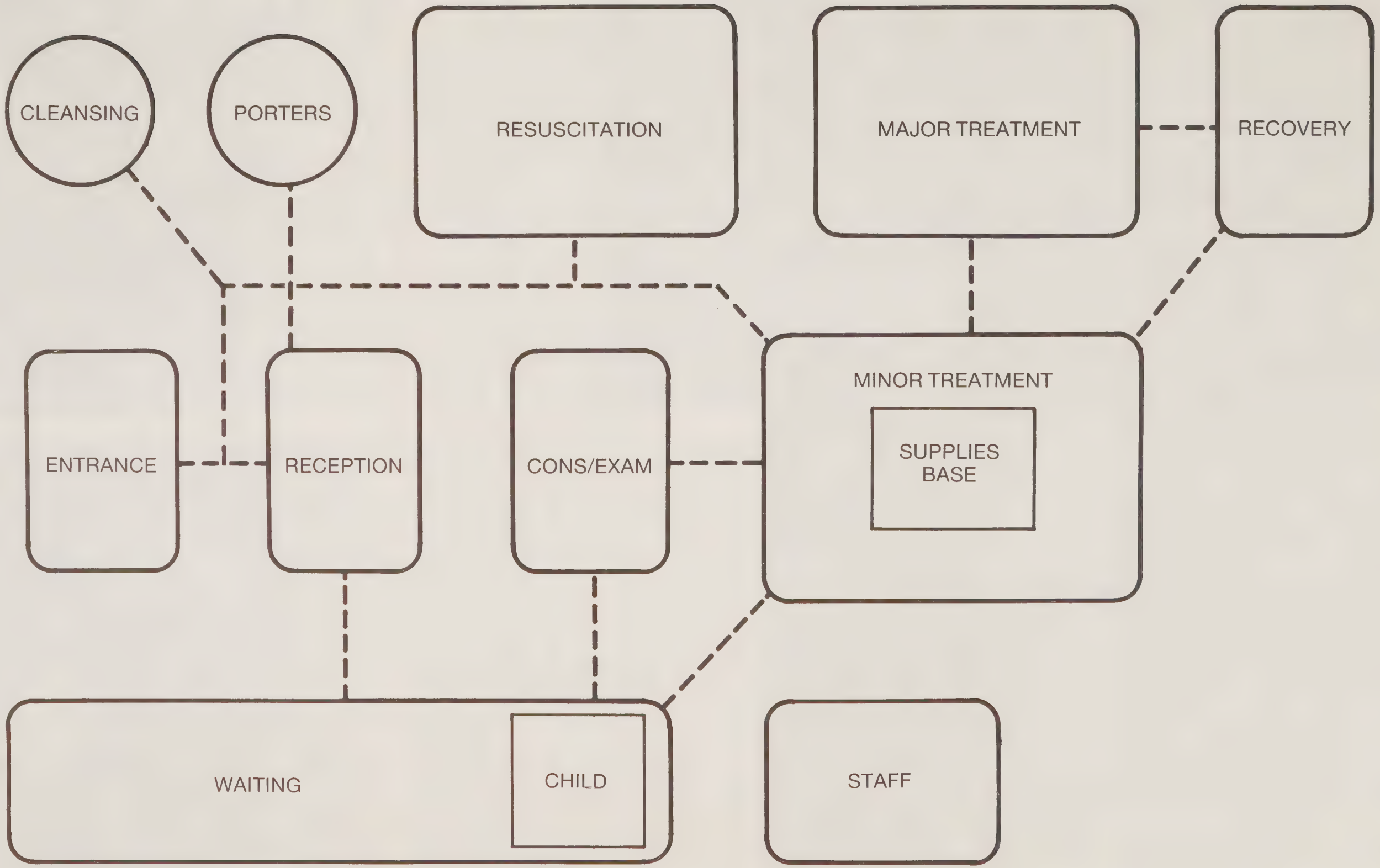


DIAGRAM 4 DIAGRAMMATIC LAYOUT OF DEPARTMENT

Reception counter at main entrance, fitted with security screen

ment and the main waiting area. A reception counter of standing height, with a minimum of two places, is required, with facilities for interviewing patients and for recording personal details in some degree of privacy. A hatch with counter or access door should be provided between the reception and the stretcher patients entrance area. Consideration must be given to the protection from assault of staff who work in the reception, for example by the use of security screens, departmental intercom or alarm systems. Space is required for the storage of A and E records for up to two years; space for the use of micro-computers for patients records should also be considered. (See paragraph 3.12).

Reception counter at main entrance, open access

AMBULANT PATIENTS

Waiting area

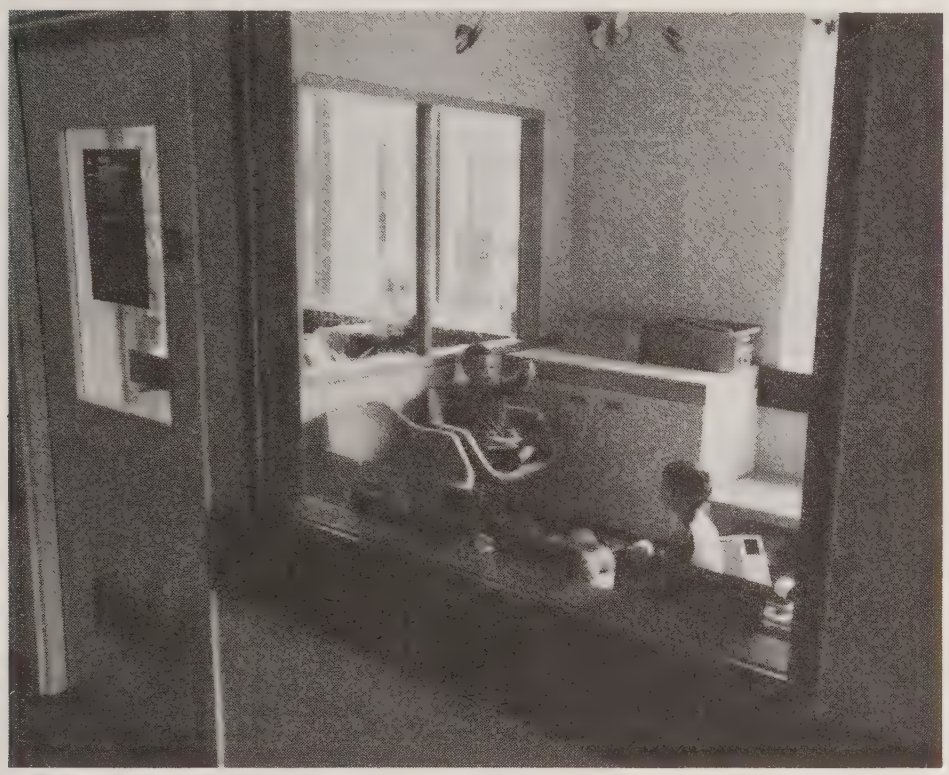
4.6 This should consist of a large open plan area for adults/escorts, and an integral enclosed area for children, glazed with safety glass, which is easily observed from reception and which incorporates a child WC/nappy changing facilities ensuite. Toilet facilities for adults/wheelchair patients and escorts, with graffiti-resistant finishes, should be provided nearby. Seating should include a number of high-backed chairs with arms, and adequate space must be allowed for wheelchairs.

Consulting/Examination

4.7 A room (or rooms) equipped for consultation and limited medical examination of ambulant patients is

Main waiting area

Main waiting area with children's enclosure



Children's waiting room

required, sited between the main waiting and treatment areas.

STRETCHER PATIENTS

Porters' base

4.8 A base should be provided at the stretcher patients entrance for porters and ambulance staff. Facilities for hand washing are required nearby. There should be space adjacent for the parking of accident trolleys, wheelchairs and the storage of stretcher poles and linen without any encroachment into the circulation space.

Patient cleansing

4.9 Facilities are required, in a separate room by the stretcher patients entrance, for cleansing patients who are infested with vermin or whose clothing has been contaminated by excessive soiling or injurious chemicals (see paragraphs 2.11 to 2.14). The room should be planned to permit use also for ordinary stretcher patients: adequate storage facilities are required adjacent to equipment and supplies used for decontamination. (Staff attending these patients and whose clothing has become grossly contaminated may use the shower for decontamination before changing into clean uniform: see also paragraphs 4.4, 4.39 and 6.89.)

Patient cleansing room

Emergency/Resuscitation room

4.10 Depending on its size, an A and E Department must provide at least two or three spaces for patients who arrive seriously injured or ill, to be assessed, resuscitated and treated simultaneously in visual privacy. A specific room designated for this purpose is required in many situations. To achieve the best utilisation of space in smaller departments it may be more appropriate to utilize stretcher cubicles or rooms provided for general use; such rooms should then be adjacent to one another. In spaces to be used for resuscitation it should be possible to perform clinical procedures from all sides of an accident trolley which should be capable of being rotated through 360° within each curtained space.

4.11 Storage and parking space is required in the room for a wide range of supplies, drugs and electro-medical equipment. Consideration needs to be given to the location of piped and electrical services, for example the use of ceiling pendants to obviate trailing cables and hoses. As patients requiring the use of this room are very ill, may require surgical procedures and are particularly susceptible to temperature changes, it is important that the clinical environmental conditions provided are comparable to those achieved in a major treatment room. Provision must be made near the resuscitation room for the mobile X-ray apparatus to be parked.

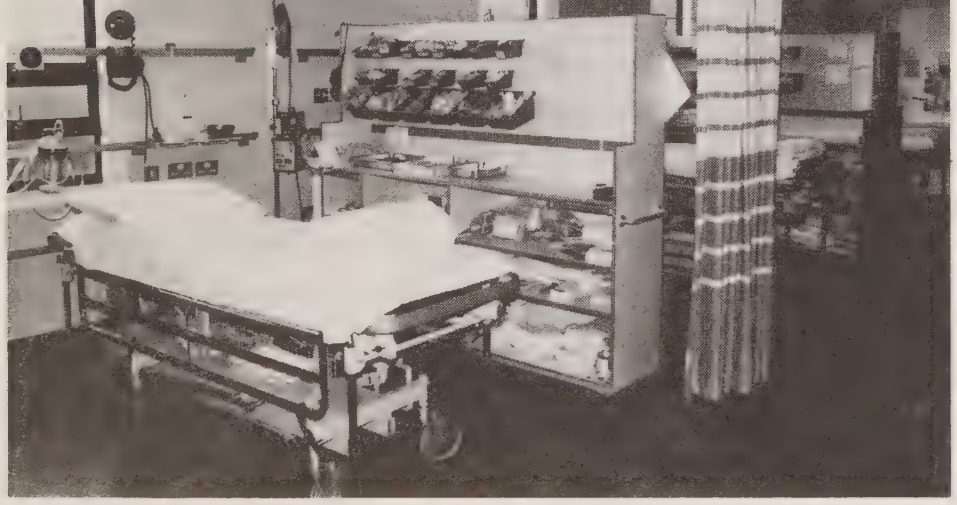
Examination Treatment Area (see Diagram 5)

4.12 To permit flexibility of use and efficient management of the A and E Department, the majority of patient examination and treatment cubicles should be sited in an open plan area. Direct access is required to a supplies storage base, which ideally should be positioned in the middle, surrounded by the cublicles. Observation and supervision of every patient space must be possible from the staff base.

Sub-waiting

4.13 Depending on the design solution, a sub-wait for up to 10 persons may be required in the vicinity of the treatment area. This can be used for patients awaiting cubicle space, those who have been to X-ray and A and E patients returning for further treatment.

Resuscitation room showing two of the three trolley spaces



Resuscitation room showing patient divider screens with facility for holding ready-to-use supplies

Ambulant treatment cubicles

Cubicles and rooms

4.14 *Walled cubicles* are required for the medical examination and treatment primarily of ambulant patients in visual and auditory privacy provided by three full height walls and a curtain. To permit flexibility of use cubicles should be equipped with an accident trolley. One cubicle or room should be capable of being dimmed out for ophthalmic and ENT examination and treatment.

4.15 *Curtained cubicles* should be provided for the medical examination and treatment of stretcher patients in visual privacy afforded by cubicle curtains. It should be possible for staff to perform clinical procedures particularly in an emergency from all sides of an accident trolley. If the trolley is capable of being rotated 360° within the curtained cubicle, there should be sufficient space for staff to carry out clinical activities.

4.16 *Stretcher rooms*: Some patients will need complete privacy for their medical examination and treatment, others may be noisy and require rooms which have sound containment. Depending on the size of the A and E Department two or more rooms will be required for a full sized accident trolley. One of the rooms should be primarily suitable for children and appropriately decorated, and should also be capable of use by adults.

4.17 Subject to local operational policies, one of the rooms described in paragraph 4.16 could be used for relatives to see a dead patient quietly in private.

Drugs/Alcohol recovery

4.18 Facilities are required for drug addicts or drunks to recover without harm to themselves or others. A mechanically ventilated, sound-attenuated room is needed with space for a mattress to be placed on the floor. Designers should note that patients in this room may be very ill and observation is critical. For these reasons the room should

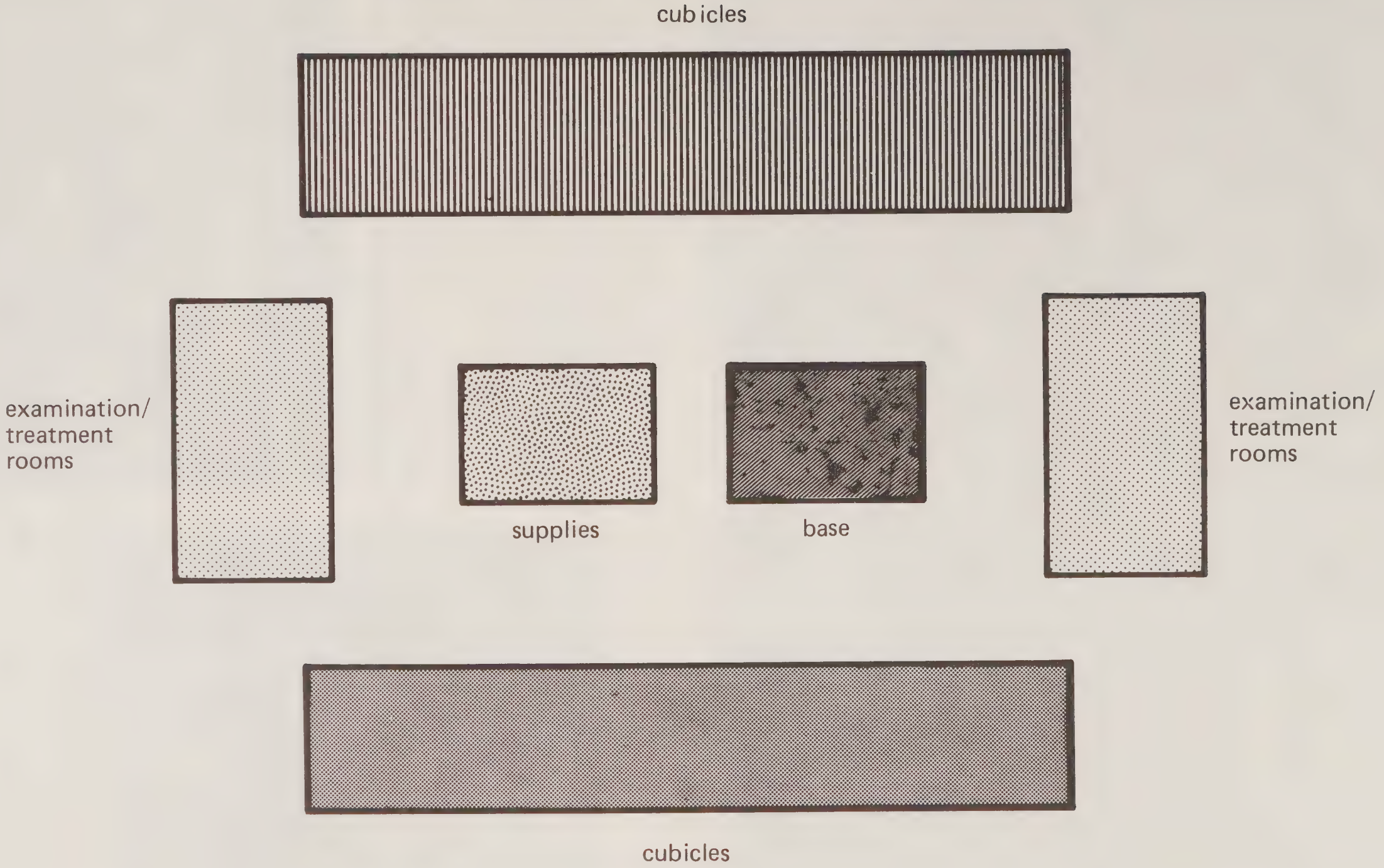


DIAGRAM 5
Principles of Examination/Treatment Areas Layout

Opthalmic/ENT examination and treatment cubicle

Stretcher treatment cubicle

be sited in the main treatment area, with safety glazing in door panels. The finish of surfaces and fittings should permit easy cleaning and be resistant to damage and fire; provision is needed for hosing down the floor. The room should be of sufficient dimensions to accommodate the use of an accident trolley.

Supplies base

4.19 The supplies storage base is an island facility accessible from all sides and sited at the centre of the treatment area. Storage space is provided for a wide range of sterile and clean supplies, lotions and drugs in lockable cupboards, and the parking of dressing trolleys. The supplies base provides facilities for the preparation of dressing trolleys for use in examination/treatment cubicles and rooms, and replaces the need for a conventional clean utility.

Staff base

4.20 A base for nursing and medical staff is required in conjunction with the supplies base to facilitate managerial tasks associated with control of the A and E Department, such as clerical functions and the supervision of patient

Supplies base sited central to cubicled treatment area

Supplies base for holding ready-to-use sterile supplies sited centrally to the cubicled treatment area. Note the task area lighting from the illuminated canopy

flow through treatment areas. It should be regarded as the focal point for communications including the termination of alarms, and telephone communication with the ambulance authority.

Dirty utility/WC specimen

4.21 A dirty utility room should be provided with facilities for simple blood and urine tests, the storage and disinfection or disposal of bed pans and urine bottles and vomit bowls. A patients' WC suitable for specimen collection should be adjacent to the dirty utility.

TREATMENT SUITE

4.22 As stated in paragraph 2.10 facilities required for minor operative procedures should be provided in suitable major treatment rooms which ensure a controlled clinical environment. Depending on the size of the department two such rooms plus ancillary accommodation should normally be provided. The following rooms form this suite.

Major treatment/Plaster room

4.23 This room requires mechanical ventilation to prevent the ingress of air from other areas when doors are closed, and when doors are opened briefly during a treatment procedure. Supply air filtration and temperature control standards are described in paragraphs 6.29 and 6.33. A ceiling mounted 'no break supply' operating lamp, which is shadowless, is required. Piped services (ie oxygen, nitrous oxide, medical vacuum) should be supplied via two rigid ceiling pendants located diagonally to facilitate alternative positions of the patient on an accident trolley. There should be a wall or ceiling-mounted terminal unit for coupling with a non-interchangeable connector leading to pipework appropriate to a system for scavenging expired anaesthetic gases (see HC(76)38 — in Wales, WHC(76)34 — which deals with the pollution of operating departments, etc by anaesthetic gases). If local policy determines that non-flammable anaesthetics will be administered in the major treatment/plaster room, antistatic flooring will not be required and notices prohibiting the use of flammable anaesthetics must be prominently displayed in this room. See paragraph 4.43 regarding the storage of flammable gas cylinders.

4.24 Facilities are required for the following activities:

a. operative procedures such as the closed reduction of fractures, the application of plaster of Paris splints and casts, suturing of wounds, incision of abcesses and other operative procedures which do not require the full facilities of the operating department;

b. administration of local analgesics and general anaesthetics with use of oxygen, nitrous oxide and medical vacuum in connection with minor operative procedures or resuscitation;

c. viewing of X-ray films;

d. scrubbing and gowning;

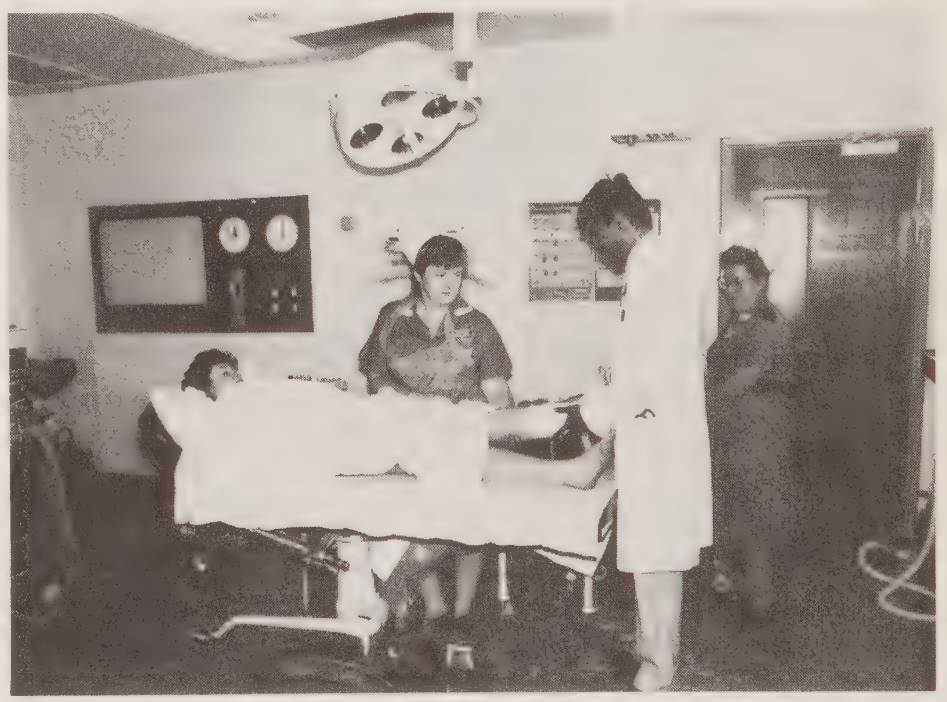
e. the movement of staff and equipment (such as anaesthesia and X-ray apparatus, cardiac resuscitation trolley) around an accident trolley;

f. storage of an immediate working supply of sterile and clean supplies, such as plaster of Paris and anaesthesia requisites.

This room should be sited in close proximity to the resuscitation room to permit overflow of patients in emergency.

Major treatment room

4.25 This is similar to the major treatment/plaster room but of a smaller size and is intended primarily for suturing wounds. The environmental conditions described in the previous paragraphs apply. A ceiling mounted 'no break supply' operating lamp, which is shadowless, is required. Only one ceiling pendant containing piped services (ie oxygen, nitrous oxide and medical vacuum) will be required. (See paragraph 4.23 regarding waste anaesthetic gas scavenging and the use of non-flammable anaesthetics).



Major treatment/plaster room

4.26 Facilities are required for the following activities:

a. suturing of wounds and other minor operative procedures;

b. administration of local analgesics;

c. viewing of X-ray films;

d. scrubbing and gowning;

Modular demountable storage for ready-to-use supplies — major treatment room

e. the movement of staff and equipment (such as cardiac resuscitation trolley) around an accident trolley;

f. storage of an immediate working supply of sterile and clean supplies.

A and E Departments with a work-load well in excess of 70,000 attendances per annum may require two major treatment rooms, in addition to the major treatment/plaster room. Departments with a workload of below 30,000 attendances will require only one major treatment/plaster room.

Clean utility/Supply

4.27 This space should be sited to serve both the major treatment rooms. It will be used for storing sterile instruments sets and clean supplies.

Dirty utility/Disposal

4.28 This space should also be located convenient to the treatment and suture rooms. Facilities are required for storing rubber boots and protective aprons, cleansing trolleys, and the disposal of liquid and plaster of Paris waste. Mechanical extract ventilation will be required.

Recovery/Rest

4.29 There must be a separate area where patients can remain for a time resting on a trolley following treatment or the administration of an anaesthetic. The number of trolley spaces required will depend on the size of department, ie ranging from one (20,000 total attendances) to four (70,000 total attendances). These could be sited in the treatment area to simplify supervision and staffing. Ready access to dirty utility facilities is required.

ADMINISTRATION

4.30 A number of offices are needed in the A and E Department. The space provision for each office should be similar because, provided a proportion of the rooms are located either in the administrative or waiting/treatment areas of the department, flexibility in use can be achieved depending upon local policies. For example one of the rooms sited near the main waiting area may be suitable as a consulting room, for medical staff, or as a sister's office. Alternatively a room in the administrative area could be used. A small night safe is required for the temporary holding of patients' valuables at night and at the weekends.

Sister/Charge Nurse office*

4.31 An office is required for administrative work, for interviewing and for discussions with staff.

Nursing Officer's office*

4.32 Where a nursing officer is based in the A and E Department an office similar to that for sister/charge nurse should be provided.

Medical office*

4.33 An office is required for the Consultant or senior medical staff for the co-ordinating of day-to-day management of the department. It should be located with easy access to the secretarial/typing office and be associated with other administrative facilities in the A and E Department. A and E Departments with a workload of more than 70,000 attendances may require an additional office for medical staff.

***NOTE: See Health Building Note 40, 'Common Activity Spaces', Volume 1.**

Secretarial/Typing

4.34 This room provides facilities for secretarial activities associated with the medical and nursing administration of the A and E Department. It should be located near the medical office.

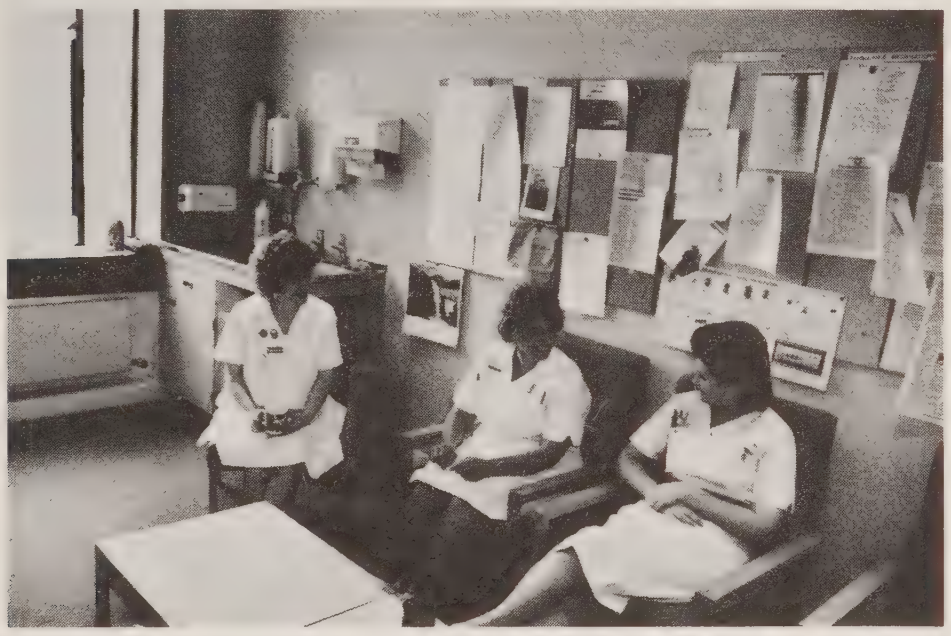
Relatives interviews

4.35 A room suitable for distressed relatives and interviews should be provided in a quiet location of the Department. Semi-easy chairs are required, and desk space for one person should be provided with a socket for a telephone.

STAFF FACILITIES

Rest room/Seminar with beverage point

4.36 It is important to provide a suitable room where staff may rest and relax during breaks and hold informal discussions. Semi-easy chairs are required and also facilities to prepare occasional beverages for staff, patients and relatives. The beverage point should be sited so that as well as being available for use by staff within the room there is external access to the point to enable it to be used by staff not using the rest room. The rest room/seminar should be in association with other staff facilities and located away from patient treatment and traffic areas.



Staff restroom with beverge point

Staff changing/WC facilities

4.37 Provision of this accommodation will depend on whole hospital policy for staff changing, ie centralised or decentralised and reference should be made to Health Building Note 41 'Accommodation for Staff Changing and Storage of Uniforms'. If the whole hospital policy is for staff to use central changing facilities, then separate small cloakrooms for male and female staff, with WC and hand washing facilities should be provided. This should suffice for staff to hang coats and cloaks and keep valuables securely in small lockers.

4.38 If the whole hospital policy is for decentralisation, changing accommodation for male and female staff, WC with hand washing facilities and full length lockers will be required on the lines indicated in Health Building Note 41.

Duty/Overnight stay/Staff shower

4.39 This will be required for a doctor who needs to remain on call at night in the A and E Department. In addition to facilities for rest/sleeping, desk space should be provided enabling the room to be used during the day. There should be direct access to sanitary and shower facilities. These facilities may also be used by other staff who require a shower because their body or clothing has become soiled in the course of duties (see also paragraph 4.9).

ANCILLARY ACCOMMODATION

Main equipment and supplies store

4.40 Clean and sterile supplies required for immediate use will be kept at the supplies base, in the resuscitation area, treatment suite, clean utility, and in individual treatment spaces. Storage is required for a linen exchange trolley, or linen stored on shelves, equipment and bulk clean supplies including some plaster of Paris requisites and a limited number of oxygen cylinders for emergency replenishment on accident trolleys.

Major incident equipment store

4.41 A small store is needed for the storage of major incident packs and equipment.

Decontamination equipment store

4.42 A small store is needed for the storage of decontamination equipment used for cleansing patients after exposure to chemicals, and for the storage of radiation medical equipment.

Storage of gas cylinders

4.43 Guidance on this subject is given in letter WKO(85)1 dated February 1985 (in Wales, letter CAWO(85)1) concerning 'Code of Practice for the Storage of Medical, Pathology and Industrial Gas Cylinders'. Authorities' attention is especially drawn to paragraph 12 in the enclosure with the letter about 'Ready Use Stores'. According to local policy, the clear labelling, as required in sub-paragraph 12.4 of that guidance, should include a prohibition of keeping flammable anaesthetic gases in this store (see paragraph 4.23).

Crutches and splint store

4.44 Provision is required for storage, so arranged as to enable easy access to different sizes of crutches and splints, walking aids and tripods. If the fracture clinic is sited adjacent to the A and E Department consideration should be given to sharing this facility between the two.

Sterile supplies store

4.45 A back-up store is required for sterile supplies, such as bulk dressing packs, syringes and needles, to supplement working supplies held in individual spaces within the department.

Cleaners' space*

4.46 Domestic services staff provide the immediate day-to-day cleaning service from this room. It provides storage for cleaning materials and equipment in daily use, and facilities for the various activities undertaken.

Disposal holding*

4.47 The disposal of used items (depending on whole hospital policy) is likely to be in bags. A room for the temporary segregated holding of returns from the Sterilizing and Disinfection Unit, refuse and linen bags pending disposal, should be provided at the entrance to the Department leading to the hospital street or corridor.

***See Health Building Note 40, 'Common Activity Spaces', Volume 1.**

Department main store for disposables and linen

Switchboard or cupboard

4.48 The electrical supply will be brought to a departmental switchboard or cupboard suitably identified and located to minimise the cost of both the main and sub-circuits necessary. The switchboard or cupboard should house the main isolators, distribution equipment etc and be designed to permit ease of operation and maintenance, and be capable of being locked to prevent unauthorised interference.

5 Environmental and Other Topics

Works Guidance Index

5.1 Whilst this HBN provides guidance that is current at the time of publication, it must be borne in mind that there are wider considerations such as medical gases, Legionnaires Disease, fire, energy conservation etc covered by other published guidance which must also be taken into account. Additionally, some aspects of the guidance in this HBN may from time to time be amended or qualified and it is necessary for project teams to check with the current edition of the Works Guidance Index. The Index is published by the Department in May each year and updated in September and January. It should be noted that as the Index covers the guidance current in the previous year, it carries the previous year's date.

Statutory and other requirements

5.2 It is Government policy that health buildings should comply with the technical requirements of all relevant statutes and regulations though at the time of writing not all the procedural requirements of such legislation are enforceable against health authorities as Crown bodies. Attention is particularly drawn to HC(86)14 (in Wales, WHC(87)7) concerning Food Hygiene and Pest Control in the Health Service and HC(87)3 (in Wales, WHC(87)8) concerning Health and Safety at Work. These give the practical implications of the change in the law on Crown Immunity. Health buildings should also comply with all relevant codes of practice and standards (including Health Service Fire Standards). This guidance takes account as far as possible of all statutory and all other requirements currently in force but, nevertheless, health authorities are reminded of their responsibility for ensuring compliance with statutes, regulations, codes and standards.

Economy

5.3 The planning of hospital buildings requires design solutions which not only satisfy functional requirements but also ensure maximal economy in respect of both capital and running costs. Due weight must therefore be given to the questions of space provision, maintenance (including cleaning), energy consumption and staffing requirements.

5.4 Planning should ensure that spaces are used as intensively as possible and are not unnecessarily duplicated. Economical space provision can be achieved in the following ways:

a. by planning for spaces to be used more intensively for a particular purpose. This means that the amount of space for a service or group of services should be no more than is needed for the anticipated workload, staffing levels and available revenue allocation, and that spaces should be used more, where possible, by different users of the same specialty;

b. by planning for spaces to be used for more than one function or purpose. This means reducing the specialised nature of accommodation, when possible, so that its use by various people for various purposes is not unduly restricted or precluded.

To ensure that there is no over-provision of new accommodation, project teams should first evaluate the utilisation of similar existing facilities in relation to their workload and staffing.

Fire precautions

5.5 It is essential that project teams familiarise themselves with the guidance contained in the FIRECODE suite of documents which contain the Department's policy and technical guidance on fire precautions in hospitals and other NHS premises. In particular, the need for structural fire precautions and means of escape from the whole accommodation must be taken into account at the earliest possible planning stage. The key document for these aspects in hospitals is FIRECODE: 'Fire Precautions in new hospitals', HTM 81.

5.6 In addition, basic policy, principles and key management guidance are contained in 'FIRECODE: Policy and Principles'. Other FIRECODE documents include the Health Technical Memoranda '80' series (which give technical guidance on various building, engineering and equipment issues), the Fire Practice Notes series (dealing with various specialist aspects of fire precautions) and Nucleus guidance. Existing HTMs will, in due course, be reissued in FIRECODE format. The suite includes 'FIRECODE: Directory of Fire Documents' which lists references to relevant legislation and relevant fire precautions guidance issued by DHSS and other sources, for example, the Home Office. Publications in the existing HTM '80' series are listed in the Bibliography at the end of this Note.

5.7 It is important to establish during the design stage those aspects of fire safety strategy which affect the design, configuration and structure of a project. At appropriate stages of the design process the architect and engineer should discuss and verify their proposals with the local fire authority and ensure that the project team and all other planning staff are fully acquainted with the fire safety strategy for the design in terms of operation (staff responsibilities, etc), equipment provision, and buildings and engineering layouts. Health Technical Memoranda 57, 58, 59 and 60 give detailed information on the selection of fire resisting components.

5.8 The principles of fire safety apply equally to new projects and to alterations and upgrading of existing buildings.

Smoking

5.9 Health Circular HC(85)22 dated May 1985 — WHC(85)31 dated June 1985 in Wales — provides guidance about smoking on health premises. While recognising that the responsibility for determining local policies rests with the health authority, the circular recommends that smoking should be restricted as far as is practicable and, where it is permitted, confined to specially designated areas which are clearly signposted. In such areas ventilation should be sufficient to prevent discomfort to non-smokers and the spread of odours to other areas of the premises.

Upgrading or adaptation of existing buildings

5.10 The standards set out in this guidance essentially apply to the provision of accommodation by new building and it is not intended that they should be applied retrospectively to existing stock. However, the principles are equally valid and should be applied, so far as is reasonably practicable, when existing accommodation is being upgraded or new accommodation is being constructed within an existing building which may previously have been used for other purposes.

5.11 The cost of upgrading work should conform to the guidelines indicated in the Department's WKO letter (81)4 issued on 24 July 1981 (AWO(81)8 in Wales). Those guidelines take into consideration the estimated life of the existing building and the difference in cost between upgrading a building and new building.

5.12 Before any decision is made to carry out an upgrading project consideration must be given to the long-term strategy for the service, the space required for the new service, and the size of the existing building. Regard must also be paid to the orientation and aspect of the building and the adequacy and location of all necessary support services. If there emerges a prima facie case for upgrading, a thorough analysis of all functional and physical conditions of the existing building should be undertaken.

5.13 When comparing the cost of upgrading or adapting an existing building to that of a new building, in addition to the building cost, due allowance must be made for the cost of relocating people, demolition and salvage costs, disruption of services in a phased project, and the temporary effects on running costs in any impaired functioning of areas affected by upgrading.

5.14 The check of physical and other aspects of existing buildings should include:

a. availability of space for alterations and additions;

b. type of construction;

c. insulation;

d. age of the buildings, conditions of fabric eg external and internal walls, floors, roofs, doors and windows, which may be determined by a condition survey;

e. life expectancy and adequacy of engineering services, ease of access and facility for installation of new wiring and pipework, if required;

f. the height of ceilings (high ceilings do not necessarily call for the installation of false ceilings which are costly and often impair natural ventilation);

g. changes of floor levels to obviate hazards to disabled people (see paragraph 5.19);

h. fire safety (see paragraphs 5.5 to 5.8); and

i. physical constraints to adaptation such as load-bearing walls and columns.

5.15 Having decided that existing premises are suitable for upgrading or conversion, the main requirement will be to assess how best the accommodation can be adapted so as to facilitate the practice of modern care. The main environmental factors which should be considered are the same as for new building.

5.16 Upgradings must conform to current fire safety and other statutory regulations. It is very difficult to estimate the fire resistance of floors, walls and doors of existing buildings.

5.17 This summary of the main aspects of upgrading is general in character and it is recognised that each upgrading project will present its own individual problems. In many instances compromises may have to be made between building note standards and what is possible to achieve. Upgradings should be functionally sound — not merely cosmetic — and appropriate for the projected needs of patients and staff for a number of years to come.

Damage in health buildings

5.18 When designing and equipping health buildings, the likely occurrence and effects of accidental damage should be considered. Damage in health buildings has increased over the years due to the use of heavier mechanical equipment for the movement of patients and supplies and, to some extent, as a result of lightweight, often less robust, building materials. Most damage to doors, and to floor and wall surfaces, is caused by wheeled traffic. Measures to minimise damage should be taken in the form of protective corners, buffers and plates, and to proper continuation of floor surfacing ie strong screeds and fully bonded floor coverings. Protective devices should be capable of being renewed as need arises. Reference should be made to the relevant British Standards, to the advice in the Department's DS (Supply) letter 42/75 dated 5 August 1975 on the buffering of movable equipment, and to the guidance contained in Volume 2 of HBN 40 'Common Activity Spaces'. Further information is provided in Health Technical Memoranda 56, 58 and 61.

Disabled people

5.19 It is essential to ensure that suitable access and facilities are provided for disabled people who have problems of mobility or orientation. This includes, besides the wheelchair-bound, those who for any reason have difficulty in walking and those with a sensory handicap such as a visual or hearing impairment. Authorities are reminded of the need to comply with the provisions of the Chronically Sick and Disabled Persons Act 1970 as amended by the Chronically Sick and Disabled Persons (Amendment) Act 1976, the Disabled Persons Act 1981, the Building Regulations 1985, and the Buildings (Disabled People) Regulations 1987. Attention is also drawn to BS5810: 1979 'Access for the Disabled to Buildings'. One of the effects of the 1981 Act is to apply this British Standard to premises covered by the 1970 Act, which includes those open to the public.

Privacy
5.20 The design of the accommodation must preserve the dignity and privacy of patients, particularly where men and women are treated in adjacent areas and share certain accommodation and circulation spaces. These must be reconciled with the need for unobtrusive observation which is vital for the care of the patient.

Education/Training
5.21 The overall spaces should be so designed that in-service training can take place without the need for additional accommodation. When medical students are taught in the A and E Department in such numbers that they require additional space, reference should be made to the document 'Teaching Hospital Space Requirements' (DS 65/74 and DS 86/74 — in Wales, HSD 3/57/1).

Portering
5.22 Movement of goods or patients within, to or from the A and E Department may be beyond the capacity of the occupants. This will generate requirements for portering assistance.

Internal spaces
5.23 Internal rooms may contribute to economy in planning but the resulting continuous need for artificial lighting and mechanical ventilation will add to both capital and running costs. Such rooms do not provide good working conditions and staff may therefore be difficult to retain. Internal spaces should be used only for activities of infrequent or intermittent occurrence or which demand a controlled environment. Rooms that are likely to be occupied for any length of time by staff or patients should have windows.

Flooring
5.24 It is important to select a floor covering which contributes towards the creation of an attractive environment, but which does not present a hazard to disabled people or the movement of wheeled equipment. It is important that whatever floor covering is chosen can be effectively cleaned, maintained and, where necessary, repaired. Rapid developments in soft floor covering technology have produced a wide variety of new materials. (See report of the Floor Covering Study Group issued to Health Authorities with HN(78)32 — WHN(78)92 in Wales — and Health Technical Memorandum 61 — 'Flooring'). Floors should not present or appear to present a slip hazard and the patterning should not produce disorientation. Changes of floor level should be avoided wherever possible. Surface drag, static electricity, flammability, and infection hazards are other factors which need to be considered.

Maintenance and cleaning
5.25 Materials and finishes should be selected to minimise maintenance and be compatible with their intended function. Building elements that require frequent redecoration or are difficult to service or clean should be avoided. Special design consideration should be given to elements such as entrances, corners, partitions, counters and any others which may be subjected to heavy use. Floor finishes should be restricted in variety and, where soft floor coverings are specified and spillage is anticipated, should have a backing impervious to fluids and a non-absorbent pile. Wall coverings should be chosen with cleaning in mind. Health Technical Memoranda 56, 58 and 61 give guidance on these aspects for partitions, internal doorsets and flooring.

Courtyards
5.26 There are several reasons why courtyards may usefully be provided in hospital buildings. First, they enable more rooms to receive natural daylight and ventilation. Secondly, they provide an outlook which can compensate for the lack of a longer view. Suitable layout and planting can provide a stimulating outlook and can help to preserve privacy in surrounding rooms. Ground-cover planting is often more successful than grass and is easier to maintain. Access for maintenance and cleaning should be from a hospital street or other corridor so that patients and staff are not disturbed. Adequate water points, power-points and lighting, if necessary, should be provided in all courtyards. Reference should be made to HBN 45 'External Works for Health Buildings' (in preparation).

Critical dimensions
5.27 The figures in the Appendix contain information on critical dimensions for some of the activities mentioned in this Note which are not included in the 'Common Activity Spaces' Building Note (HBN 40).

Information technology in the NHS: Provision for Automatic Data Processing (ADP)
5.28 Information technology should have a central role in health management. The use of computers and telecommunications — and, indeed, the rate of technological innovation — continues to increase. The implications for building project teams are threefold: firstly, a requirement for the housing of the computer(s); secondly, a requirement for the provision of ducts for transmission cabling; and thirdly, sufficient space and adequate power supplies for modems, visual display units, printers and associated software and stationery. Even if the introduction of automatic data processing is not proposed at the time that the project team completes its report, it will be advisable to design in such a way that equipment can be introduced easily and quickly at some later date.

5.29 There are two principal matters of concern: visibility, and noise. Visual display units (VDUs) are now a familiar sight and it will easily be appreciated that they cannot be reduced beyond a certain size. Consequently, sufficient and convenient space must be provided for them; also, since the brightness of the letters displayed on the screen cannot exceed a certain limit, special attention must be given to the ambient lighting to ensure that the contents of the screen are legible. Furthermore, where there are facilities not only for reading, but also for entering data, additional space may be required in front of the screen for a keyboard. The problem of noise arises from the alternative way of obtaining data from the computer, namely, a printer which can provide printed paper copies of the data in the computer. Though much has been done to reduce the noise of printers, by improved design of the moving parts, and of insulated covers, no printer is perfectly silent. Noise may not be too noticeable during normal working hours, but during quiet hours it will probably not be acceptable unless special arrangements are made, such as the positioning of the printer at a site remote from patient areas.

5.30 Computing expertise is now widely available in the NHS and project teams should ensure that, at an early stage, they inform themselves concerning current and projected local computing policies, and that their proposals conform with them.

Component Data

5.31 The Component Data Base in its Mark 3 form contained specifications, design guidance and lists of selected components or firms producing selected components for use in health buildings.

5.32 The Mark 3 CDB has been replaced by a series of Health Technical Memoranda which provide specification and design guidance on building components for health building which are not adequately covered by current British Standards. No firms or products are now listed.

5.33 The numbers and titles of the HTM in the series are listed in the Bibliography at the end of this Note. (Nos. 55–65.)

5.34 The technical information in this series is the result of research and development funded by the Department as part of collaborative working arrangements over a number of years between the Department, the NHS, and industry through the medium of the Component Data Base.

6 Engineering

Introduction

6.1 This chapter describes the engineering services contained within the A and E Department and their integration with the engineering systems serving a whole site. Its purpose is not to inhibit the design solution but to acquaint the engineering members of the multi-disciplinary design team with the criteria adopted (in the terms of material specification, design conditions and reference data) to meet the functional requirements.

6.2 Documents referred to by number, eg [10], are listed at the end of this Chapter. They are numbered in order of first appearance, repeated references retaining the same number.

Model specifications

6.3 A series of model specifications for the specialised engineering services in health-care buildings have been issued nationally and are sufficiently flexible to reflect local needs. The Cost Allowance for the engineering services in each functional unit of this department is based on the qualities of material and workmanship described in the relevant parts of the model specifications.

Economy

6.4 Engineering services are a significant proportion of the capital cost and thereafter remain a continuing charge on revenue budgets. The project design engineer should therefore ensure not only the utmost economy in provision, consistent with meeting the functional requirements and maintaining clinical standards, but also the optimum benefit from the total financial resources these services are likely to absorb during their lifetime.

6.5 Where alternative design solutions are available their consequential capital and running costs should be compared using option appraisal techniques[1] so that due consideration is given to the need for, and the costs of, maintenance and the eventual replacement of plant and equipment.

6.6 The economic appraisal of alternative design solutions should include the heat conversion and distribution losses at the point of use. Where buildings are located remote from the development's load centre these losses can often equal the useful energy consumed.

6.7 To encourage energy management, facilities for the temporary installation of metering for all services should be provided at main intake points to this department. HSE Data Sheet DR 6[2] gives information on the selection and use of metering equipment.

6.8 After satisfying the Building Regulations[3] on the standards of thermal insulation provided, consideration should be given to the economics of additional insulation to the ground floor slab and to the roof particularly where accommodation is located in a building of low-rise construction. Where there is a solidly constructed ground floor, the inclusion of floor insulation will also contribute to patient and staff comfort. Guidance concerning the economic thickness of thermal insulation relative to the cost of energy, 'K' values, temperature differences, capital costs and hours of use is given in Engineering Data Sheet CE 11.[4]

6.9 Similarly, in view of the increasing costs of generating heat energy, consideration should be given to the economics of appropriate equipment for recovering some of the value of the energy which would otherwise be discharged by mechanical ventilation systems, and also for programmed turning off, or reduction, of heating and ventilation in those spaces used only for part of the day.

Maximum demands

6.10 User demand on engineering services is often difficult to predict, but experience indicates that services designed for simultaneous peak conditions are seldom fully utilised in practice. The estimated maximum demand and storage requirement (where appropriate) for each engineering service in this accommodation will need to be assessed individually to take account of the range, size and shape of the functional units, geographical location, operational policies and intensity of use. As a guide and for preliminary planning purposes only, the following are the estimated maximum demands for an Accident and Emergency Department with annual attendance of 50,000:

Service	*Typical max. demand*	*Notes*
Heating, ventilation, DHWS	28 (kW)	
Domestic HWS (litre/sec)	1.5	Storage 375 litres (2 hours recovery)
Cold water (litre/sec)	1.6	Storage 7,000 litres (24 hour supply)
Supply ventilation (m^3/s)	1.75	
Extract ventilation (m^3/s)	1.90	Clean and dirty
Conditioned supply ventilation (m^3/s)	0.9	
Conditioned extract ventilation (m^3/s)	0.8	
Heating for air conditioning (LPHW) (kW)	17	
Cooling for air conditioning (chilled water) (kW)	13	
Electrical (kVA)	26	Includes essential 23kVA
Medical gases (litre/min)		
Oxygen	255	
Nitrous oxide	65	
Vacuum	240	
Compressed air	550	
Fuel gas	No requirement	
Steam (kg/hour)	100	Humidification only

Space requirements for services

6.11 The satisfactory performance of plant in health-care buildings is particularly important and the design should allow for ease of access and space for the necessary frequent inspections and maintenance and for eventual removal and replacement. As far as practicable, however, this access should be protected from unauthorised entry.

6.12 Recommended spatial requirements for mechanical, electrical and public health engineering services in health buildings are given in HTM 23.[5] The information in this publication is specifically intended for use during the initial planning stages when precise dimensional details of plant are not available.

6.13 The distribution of mechanical and electrical services to final points of use should, wherever possible, be concealed in walls and above ceilings. Heat emitters should be contained within a 200 mm wide perimeter zone under window sills and critical dimensions should be taken from the boundary of this zone. For costing purposes the 200 mm zone which includes the floor area occupied by minor vertical engineering ducts is included in the building circulation provision. Services above the clean and sterile areas associated with the major treatment rooms should be confined to those required for these particular areas.

Activity Data

6.14 User requirements, environmental conditions and equipment arrangements, as described in the Activity Data sheets, (Chapter 8) should be referred to when positioning service components and outlets. Where the latter are for patient operation, they should be of the simplest pattern and designed to inhibit interference.

Safety

6.15 Section 6 of the Health and Safety at Work etc Act 1974[6] imposes statutory duties on all persons who design, manufacture, supply, install or erect 'articles for use at work' to ensure as far as is reasonably practicable that such articles are safe and without risk to health when properly used. Engineering components (eg pipework, terminals, etc) are covered by the term 'articles' and thus these duties apply to the designers of engineering services for non-domestic buildings.

Fire precautions

6.16 Design guidance for the fire precautions in new hospitals is given in HTM 81.[7] Technical information concerning the design and specification of fire detection and alarm systems is detailed in HTM 82[8] which also replaces or modifies certain clauses of BS5839 Part 1[9] to meet the needs of health care premises. More general advice on fire prevention including the storage of flammable materials is given in HTM 83.[10]

6.17 The design of the engineering services should accord with the recommendations in the above series of HTMs and the engineer should verify his proposals in accordance with the procedure described in paragraphs 5.5 to 5.7.

Noise

6.18 Excessive noise in the individual areas, whether internally or externally generated and transmitted, can adversely affect the operational efficiency of the department and can cause discomfort. The limits and means of control advocated in Hospital Design Note 4[11] including its revisions[12] and the means of control given in Engineering Data Sheet DH 1[13] should provide an acceptable acoustic environment. In addition to designing for control of noise levels, there may also be a need to ensure speech privacy ie that confidential conversation is unintelligible in adjoining rooms or spaces. This will be particularly important in consulting/examination rooms, treatment rooms and interviewing rooms (particularly where these are located adjacent to waiting areas). It will also be necessary to ensure a reasonable sound attenuation between adult and children's treatment areas. The acceptable noise level and, where applicable, any requirement for speech privacy, in the individual spaces in this department is shown on the Activity Data 'A' Sheets.

Control access

6.19 Primary engineering distribution control and isolation devices must be protected against unauthorised operation, eg switchgear and fuse-boards should be housed in secure cupboards. They should be located in circulation rather than working areas and where appropriate should easily be accessible for staff operation.

Engineering commissioning

6.20 It is most important that engineering services should be fully commissioned. HTM 17[14] describes the requirements which should be included in the design and building contract documents. Flow measurement and proportional balancing of air and water systems requires adequate test facilities, eg orifice plates, venturi valves, etc to be incorporated at the design stage.

MECHANICAL SERVICES

General scope

6.21 The mechanical services include the provision of heating, ventilation, air conditioning, hot and cold water and medical gases. For cost allowance purposes, the distribution of the heating, hot and cold water and medical gas systems is deemed to commence at their points of entry into the department and includes pipework, fittings, controls and connections to equipment and terminal outlets. The cost allowance includes for the air handling, treatment and refrigeration plant, together with associated controls; for the ventilation and air conditioning systems; and also for the anaesthetic gas scavenging equipment.

6.22 For environmental requirements in individual spaces reference should be made to the Activity Data sheets. Recommended room temperatures, air change rates, hot water service temperature, etc are grouped under 'Technical Design Data' on each 'A' sheet. The 'B' sheets give the disposition of engineering outlets for the activities described.

Heating

6.23 General space heating requirements can usually be met by low pressure hot water radiators operating as a subsystem from the primary heating distribution system.

6.24 Radiators should normally be located under windows or against exposed walls, with sufficient clear space between the top of the radiator and the window sill to prevent curtains reducing the output and adequate space

below to allow cleaning machinery to be used. Where a radiator is located on an external wall, back insulation should be provided to reduce the rate of heat transmission through the building fabric.

Temperature controls

6.25 To facilitate overall temperature control the heating system should normally be controlled via an external compensator and, if practicable, zoned relative to each major elevation of the building. Where overheating in individual rooms is likely to occur, eg solar gain, or where for functional reasons variable room temperatures are required, thermostatic radiator valves should be installed. These valves should be of robust construction and selected to match the temperature and pressure characteristics of the heating system. The thermostatic head, incorporating a tamper-proof facility for presetting maximum and minimum room temperatures, should be controlled via a sensor located integrally or remotely as appropriate. Where space is restricted, or heat gains and/or losses are particularly variable, consideration should be given to the provision of thermostatically controlled fan-convectors fitted with low-limit control.

Ventilation

6.26 Recommendations for the ventilation of individual spaces in this department are shown on Activity Data 'A' sheets. Mechanical ventilation systems are expensive in terms of capital and running costs and planning solutions should be sought which take maximum advantage of natural ventilation.

6.27 It is acknowledged that planning constraints imposed by the building shape and/or functional relationships of specific spaces will often result in some measure of enclosed internal areas. Ventilation costs can however be minimised by ensuring that wherever practicable core areas are reserved for rooms that require mechanical ventilation irrespective of whether their location is internal or peripheral. Examples are sanitary facilities, dirty utility, beverage preparation areas, and rooms whose clinical or functional requirements have specific environmental needs and where for reasons of privacy and absence of solar gain, etc, windowless accommodation is acceptable. Other spaces appropriate to core areas are those which have only transient occupation and therefore require little or no mechanical ventilation. Examples are circulation and some storage areas.

6.28 Air movement induced by mechanical ventilation should be from clean to dirty areas where these can be defined. Diffusers and grilles should be located to encourage uniform air movement within the space. The design should allow for an adequate flow of air into any space having only mechanical extract ventilation using transfer grilles in doors or walls to connect such spaces to naturally ventilated corridors. Such arrangements however should avoid the introduction of untempered air and should not prejudice the requirements of fire safety or privacy.

6.29 The fresh air supply should be tempered and filtered before being distributed via high level diffusers with output profiles designed to avoid discomfort to lightly clad patients. Ventilation supply plant should include air filters having a minimum average dust spot efficiency of 25% and a minimum arrestance of 85% when tested in accordance with BS 6540, Part 1.[15] Filters must be readily accessible for replacement and maintenance purposes and provided with a pressure-differential indicator; coarse pre-filters may be necessary where the intake air is exceptionally polluted. Heater batteries should be sized for the ventilation requirements only, ie not the fabric loss.

6.30 A separate extract system will be required for 'dirty' areas, eg utility and sanitary facilities and a dual motor fan unit with an automatic changeover facility should be provided to ensure that these rooms are always maintained at a negative pressure when the Department is in use.

6.31 External discharge arrangements for extract systems should be protected against back pressure from adverse wind effects and located to avoid re-introduction of exhausted air into the building through air intakes and windows.

Ventilation controls

6.32 Supply and extract ventilation systems should include local controls and indicator lamps to confirm the operational status of each system. Where the use of the system is on a regular daily pattern, a time-switch control with manual override for a limited period should be considered. Where a system is provided for a particular space the indicator should be in or immediately adjacent to that space and, in the case of a more general system of ventilation, eg toilet areas, the indicator should preferably be located at the staff base. Where manual controls are available for staff use, they should be provided with labels clearly defining their functions.

Air conditioning plant and controls

6.33 Provision should be made for providing conditioned air to the major treatment room, the major treatment/plaster room, the associated clean utility, and to the resuscitation rooms. The plant should be capable of maintaining winter and summer design temperatures in these rooms, as detailed on the Activity Data sheets. This plant should be capable of providing either heating or cooling throughout the year depending on the room requirements.

6.34 The plant should be on time switch control to reduce the ventilation rate during the night, whilst sustaining a positive pressure within these rooms, and also, if practicable, to close down the cooling plant. Plant operational status, indicating lights and a manual override, should be provided so that the staff can restore the plant promptly to its full operational state.

6.35 A positive air movement should be maintained from the major treatment rooms to avoid ingress of air when all doors are closed and when one door is opened briefly during a treatment procedure. The growing interest in pollution by waste anaesthetic gases requires the maximum possible dilution which is also related to the fresh-air throughout. Recirculation of air should not be used although other methods of achieving energy reclaim, eg by heat exchangers, are permissible if they can be justified economically. Provision of an anaesthetic gas scavenging system in accordance with Health Circular HC(76)38[16] will effectively eliminate some sources of pollution within the treatment suite but adequate ventilation will still be required.

6.36 The general principles for the dilution of airborne bacterial contamination and for ensuring that the correct air movement control occurs are similar to those explained in detail in the Design Guide 'Ventilation of operating departments'.[17] The recommended minimum fresh air supply rates are 0.3 m^3/s for the major treatment and the major treatment/plaster rooms, 0.1 m^3/s for the associated clean utility. The recommended minimum ventilation rate for the resuscitation room is 10 air changes per hour.

6.37 The refrigeration plant capacity for the conditioned air system should be sized on the outside design condition applicable to the geographic area in which the department is sited. The design enthalpy figures should be chosen such that they will be exceeded for only 30 hours in the average year. The higher design standard (of enthalpy figures exceeded for only 10 hours in the average year) which is recommended for Operating Departments is not considered to be appropriate or justified for major treatment rooms in an Accident and Emergency Department. If the Operating Department is in close proximity, enhancement of the chilled water plant serving that department may be an economic alternative to providing a separate refrigeration plant for the Accident and Emergency treatment rooms.

Hot, cold and drinking water services

6.38 The domestic hot water supply should be taken from the general hospital calorifier installation at an outflow temperature of 60°C, ±2.5°C, and distributed to all outlets so that the return temperature at the calorifier is not less than 50°C. Outlet fittings for wash basins, sinks and showers are shown on Activity Data 'B' Sheets.

6.39 Guidance concerning the design and installation of cold water supply pipework and distribution systems is given in HTM 27.[18] For frost protection purposes and to prevent condensation staining decorative finishes all cold water pipework, valves and flanges should be insulated and vapour sealed.

6.40 Where fully potable cold water systems are not available drinking water outlets should be provided in the clean utility, the staff rest-room and the public waiting area. The supply should be direct from the mains or from a protected tank.

6.41 To control Legionellae, the water services should be designed and commissioned in accordance with the recommendations in the DHSS Code of Practice.[19]

Fire-fighting equipment

6.42 Fire-fighting equipment should consist of either hose-reels and portable fire extinguishers positioned so that adequate cover is given to the whole interior of the department. Hose-reels, in accordance with BS 5306 Part 1[20] and usually with 30 m of hose, should be located so that the jet of water from the fully extended hose is capable of reaching every point on the floor area without interruption after due allowance is made for furniture and fittings. The provision of hose reels should be considered in conjunction with the Fire Officer to avoid potential problems arising from hoses being taken through smoke stop doors and across routes for the evacuation of beds/trolleys.

6.43 As an alternative to hose-reels, 9-litre water extinguishers should be provided on the basis of one extinguisher per 200 m^2 of floor area with a minimum provision of two extinguishers per fire compartment. Carbon dioxide extinguishers should always be provided to cover electrical risks, but for other risks, eg ignited liquid or gas, either carbon dioxide or dry powder extinguishers are appropriate.

6.44 All extinguishers should comply with BS 5423[21] and further guidance concerning their selection and use is given in HTM 81.[7]

Piped medical gases and vacuum

6.45 Guidance regarding piped medical gases is given in HTM 22[22] and any subsequent published amendments. The location of terminal outlets is indicated on the Activity Data sheets.

6.46 Where nitrous oxide is used provision should be made for scavenging waste anaesthetic gases in accordance with the recommendations of BS 6834.[23]

ELECTRICAL SERVICES

General scope

6.47 The electrical installation will include main intake switchgear, the wiring and equipment for lighting, power and environmental plant, together with the earth bonding of extraneous metal work. Extensions from the hospital central systems for telephones (conduits only), clocks, fire alarms and staff location services, together with separate intercommunication and staff call systems, will also be required. These installations should comply in all respects with the current IEE Regulations for Electrical Installations[24] and conform to the requirements of HTM 7.[25]

6.48 Reference should be made to the Activity Data sheets for the recommended levels of internal illumination, disposition of outlets for power, telephones, call systems, and clocks etc in individual spaces.

6.49 The point of entry for the electrical supply will be a departmental switchroom housing the main isolators, with provision for metering, and the main distribution equipment. The switchroom will also be the distribution centre for subsidiary electrical services and, wherever possible, all equipment should be mounted at a height to give easy access from a standing position. The switchroom should be positioned so as to minimise the cost of cabling required to serve the department.

Electrical installation

6.50 The electrical installation in occupied areas should be concealed usually using PVC insulated cable in screwed steel conduit or trunking; but in certain circumstances, mineral insulated copper covered cables may be necessary. External installations should comprise PVC insulated cables in galvanised screwed steel conduit with fittings of weatherproof pattern. Steel conduit and trunking wiring ways for communication systems should also be concealed wherever possible.

Electrical interference

6.51 Guidance concerning the avoidance and abatement of electrical interference is given in HTM 14[26] and fluorescent luminaires (lighting fittings) should comply with BS 5394.[27]

6.52 Care should be taken to avoid mains-borne interference and electrical radio frequency interference affecting computers and other electronic equipment used here or elsewhere on a hospital site.

Lighting

6.53 Practical methods of lighting the various functional spaces are contained in the CIBSE Lighting Guide.[28] The choice of luminaire should take account not only of the requirement of light distribution, and visual comfort appropriate to the space, but also the operating efficiency of the light source used. Luminaries should be of a type which are easily cleaned and maintained, as well as being manufactured and tested in accordance with the requirements specified in the relevant sections of BS 4533.[29] Their location should be readily accessible for lamp changing and maintenance, but with the overriding requirement that the recommended standard of illuminance is provided to the task areas. Luminaires using fluorescent lamps should be installed when artificial lighting is required for long periods or where areas are devoid of natural light; intermittently used luminaires may be fitted with incandescent or compact fluorescent lamps.

6.54 In reception and circulation areas colour graphics and lighting should be co-ordinated to create a calm and welcoming atmosphere whilst also contributing to the safe movement of patients throughout the department.

6.55 It is essential that fluorescent lighting in clinical areas is derived from one of the recommended types of lamps having suitable colour rendering characteristics.[30] In such areas the colours chosen for walls, floors and ceilings should be carefully selected; architects and engineers should collaborate to ensure that the decorative finishes are compatible with the colour rendering properties of the lamp and that spectral distribution of the light sources is not adversely altered. HN(85)20 (in Wales CAWO(85)3))[31] describes some high efficiency fluorescent lamps with good colour rendering properties which are also suitable for general use within this Department.

6.56 Control of lighting is normally by local switches and these should be provided in sufficient numbers to allow variation in lighting options, eg reduced levels of illuminance when circumstances permit, and to encourage energy conservation. This is particularly relevant in rooms where, because daylight is restricted, supplementary artificial lighting is required for long periods in areas remote from windows.

Corridor lighting

6.57 The lighting of corridor and circulation areas, which generally are areas not covered by Activity Data sheets, should be in accordance with the guidance contained in HBN 40.[32]

Major treatment rooms lighting

6.58 A ceiling mounted minor operating theatre table luminaire should be positioned conveniently above the trolley/table to allow the light to be directed locally. Recommended mounting height is a minimum of 2.7 m above floor level. Recommended illuminances are a minimum of 30,000 lux at 1 m from the operating luminaire and a general illumination of 400 lux for the performance of ancilliary tasks. The minor operating theatre table luminaires should comply with the requirements of BS 433: Section 102.55[33] and be in general accordance with the performance specifications included in BS 4533: Section 103.2[33] with a minimum field size of 125 mm.

Controlled Drugs cupboard

6.59 In compliance with HC(77)16 (WHN(77)32 in Wales)[34] a red indicating lamp should be provided on each Controlled Drugs cupboard, with a remote indicating lamp where appropriate outside the doorway to the room in which the cupboard is located and at the corresponding staff base. The lamps should be interlocked with the cupboard to give visual indication when the cupboard is unlocked and should be supplied from an essential circuit. For further information see HTM 63 — Fitted storage systems[35] and its associated specification for electrical services. The cupboards should be in accordance with BS 2881.[36]

Socket-outlets and power connections

6.60 Sufficient 13 amp switched shuttered socket-outlets, connected to ring or spur circuits should be provided to allow all portable appliances likely to be used simultaneously to be individually supplied. Activity Data Sheets indicate specific locations for the outlets associated with individual activities; the installation of twin outlets should be considered where these activities occur in juxtaposition.

6.61 In treatment areas socket outlets should be designed so that a supply is available in these areas from at least two separately fused circuits of common phase.

6.62 Domestic cleaning appliances with flexible leads nine metres long should be assumed and socket outlets, usually in corridors, should be provided to enable such machines to operate over the whole area of the Department.

6.63 Fixed appliances rated up to 13 amps should be permanently connected to double pole switched spur boxes and fused as required. Appliances rated in excess of this load, or those requiring a three-phase supply, should be permanently connected to separate final circuits from fuse-boards and independently switched.

6.64 Local switches or other means of electrical isolation should be provided adjacent to plant and equipment to ensure the safety of operators and maintenance staff.

6.65 Heating appliances and automatically operated equipment should be provided with indicator lights to show when the equipment is energised. Such indicators should be incorporated either in the control panel of the apparatus, in the control switch, or in the socket-outlet from which the apparatus derives its supply.

6.66 The electrical supply connections to electro-medical equipment should comply with BS 5724.[37]

Emergency electrical supplies

6.67 Guidance concerning the provision of emergency electricity supplies is given in HTM 11,[38] and the grade of standby lighting provision is shown on the Activity Data 'A' sheets. Safety lighting in accordance with HTM 11[38] and BS 5266[39] should be provided on primary escape routes.

6.68 The operating luminaires in the major treatment rooms should be provided with low capacity batteries and

appropriate change over contractors to provide a 'no break' supply to these fittings in accordance with the details described in HTM 11.[38]

6.69 All socket outlets in the treatment areas of this Department should be connected to essential supply circuits.

6.70 All communication, clock and alarm systems in this department should be capable of being automatically transferred to the hospital standby generation system.

Intercom system

6.71 The location of intercom stations is indicated on Activity Data 'A' sheets. The stations should be of the 'duplex' type, with microphone and loudspeaker combined in a telephone type instrument, with automatic voice switching and automatically convertible to 'telephone mode' for privacy. The system should provide a minimum of two speech channels and incorporate an all-call paging system.

6.72 An intercom station may also be required to be linked to the adjacent Radiodiagnostic Department.

Patient/staff call system

6.73 Call points locations are indicated on the Activity Data 'A' sheets. A visual and audible indication of operation should be provided at the staff base and repeated at the main reception point to give responding staff unambiguous identification of the call source. Guidance concerning the provision of patient/staff call systems is given in HTM 15.[40] Guidance concerning bedhead units for patient/staff call systems is given in Engineering Data Sheet DU 3.1.[41]

Staff location system

6.74 The staff location system employed in the hospital should be extended to give adequate cover to this department. Guidance on these systems is given in HTM 20.[42]

Security alarms

6.75 A security alarm actuating switch or button is required at reception and staff base connected to a continuously manned security area. In some instances this should also be connected to a direct alarm link with the Police station (paragraphs 3.17 and 3.24b).

6.76 Local operational policies should determine in the planning stage whether or not staff are to be issued with personal attack transmitters. If these are to be supplied, wireways and accommodation for transmitting/receiving equipment and propogating devices, such as induction loops and/or aerials, will be required to suit the selected system.

Wiring for telephones and data links

6.77 Central telephone facilities for internal and external calls either in separate or combined form, will normally be available and should be extended to serve this department in accordance with the requirements shown on the Activity Data Sheets. Telephones will normally be of desk pattern.

6.78 One telephone in reception is to have a distinctive call and be a direct line to the local emergency services control centre. This should be ex-directory — see paragraph 3.21.

6.79 In addition to conduits for telephones and intercommunication cables, separate wireways will be required for computer links between reception and the main hospital computer system and may also be required between reception and communication equipment locations for direct radio-communication with mobile vehicles — see paragraph 3.21.

Electric clocks

6.80 Clocks should operate in conjunction with a master clock system. If such a system is not available synchronous clocks should be installed using a common clock circuit suitable for future connection to a master system. The location and types of clocks are indicated on the Activity Data 'A' Sheets. In circulation areas, clocks should be installed only where they can be viewed by numbers of staff/patients/visitors.

Fire alarm and detecting system

6.81 A monitored open-circuit system which allows the connection of breakglass call points and automatic detectors is recommended. The choice of detectors is a complex matter but types appropriate to this department are specified in the guidance in paragraphs 5.5–5.8. It should be noted that if automatic door-holders are used on escape routes then optical smoke detectors must be used.

6.82 Audible alarms should be used throughout the department with the exception of the major treatment rooms where visual alarms supplemented by buzzers should be used. The number of sounders provided should be sufficient to ensure adequate audibility — see HTM 82 (Appendix 5).[8]

Lightning protection

6.83 Protection against lightning should be provided in accordance with HTM 7[25] and HSE Data Sheet DB 2.[43]

INTERNAL DRAINAGE

6.84 The primary objective is to provide an internal drainage system that uses the minimum of pipework and remains water and air-tight at joints and connections, but is sufficiently ventilated to retain the integrity of water seals.

Design parameters

6.85 General design guidance is given in the relevant British Standards and Codes of Practice, including BS 5572,[44] and the current Building Regulations. Recommendations regarding spatial and access requirements for public health engineering services are given in HSE Data Sheet EA5.[45]

6.86 The gradient of branch drains should be uniform and adequate to convey the maximum discharge to the stack without blockage. Practical considerations such as available angles of bends/junctions and their assembly, as well as space considerations, usually limit the minimum gradient to about 1:50 (20 mm/m). For larger pipes, eg 100 mm diameter, flatter gradients can be used but require workmanship of a high standard if adequate self-cleansing flow is to be maintained. It is not envisaged that pipes larger than 100 mm diameter will be required within inter-floor or ground floor systems serving this department.

Operational considerations

6.87 Unusual and difficult maintenance problems can arise because of user interference and abuse. For example, the disposal of paper towels into WCs after hand-washing

or after their misuse for some other purpose is a frequent cause of blockages particularly in long branches laid to flat gradients. Adequate provision of disposal receptacles, or where appropriate, the installation of warm-air dryers can help to mitigate this problem.

Materials specification

6.88 The materials specified for the drainage system in this Department will depend upon their location and the nature of the effluent being discharged. Waste pipework should, as far as practicable, be concealed; where exposed, it should be metallic and very securely fixed. Although adequate for drainage requirements, UPVC may not always be acceptable to the fire officer and neither should it be installed above 'sensitive' areas, eg operating theatres, intensive therapy, radio-diagnostic, catering departments, electrical switchrooms, etc.

Chemical and radioactive contaminated waste

6.89 It is not expected that the shower in the decontamination room will be used for washing down radioactive or hazardous chemical contamination, but sometimes consideration may need to be given to this possibility. Drains carrying radioactive effluent must be sealed throughout their run to the sewer, and routes chosen with regard to the areas affected if leaks develop. For further guidance see Engineering Data Sheet NZ 1.1/1.11[46] It is recommended that drainage for this purpose should not be into a pumped system.

References

1. **Department of Health and Social Security and Welsh Office.** Health Service Management. Investment appraisal in the public sector (HN(82)34). London, DHSS, 1982. 2pp. (WHC(83)1 in Wales).
2. **Department of Health and Social Security.** Metering of energy and water consumption services (DHSS Engineering Data Sheet DR6). London, DHSS, 1980. 14pp.
3. **Building Regulations 1985.** (SI 1985 No 1065). London, HMSO, 1985.
4. **Department of Health and Social Security.** Economic thickness of thermal insulation. (DHSS Engineering Data Sheet CE 11). London, DHSS, 1986. 108pp.
5. **Department of Health and Social Security and Welsh Office.** Access and accommodation for engineering services (Hospital Technical Memorandum 23). London, HMSO, 1972. 36pp.
6. **Health and Safety at Work etc Act 1974.** HMSO.
7. **Department of Health and Social Security and Welsh Office.** Firecode: Fire precautions in new hospitals (Health Technical Memorandum 81). HMSO, 1987.
8. **Department of Health and Social Security and Welsh Office.** Fire safety in health care premises — Fire alarm and detection systems (Health Technical Memorandum 82). London, HMSO, 1982. 53pp. (Under review.)
9. **British Standards Institution.** BS 5839: Fire detection and alarm systems in buildings: Part 1: 1980. Code of Practice for installation and servicing.
10. **Department of Health and Social Security and Welsh Office.** Fire safety in health care premises. General fire precautions (Health Technical Memorandum 83). London, HMSO, 1982. 26pp.
11. **Ministry of Health.** Noise control (Hospital Design Note 4). London, HMSO, 1966. 20pp.
12. **Department of Health and Social Security.** Health services management — Hospital Design Note 4 (noise control): amendments to appendices II, IV and VII (HN(76)126). London, DHSS, 1976. 2pp. (In Wales, WHN(77)1).
13. **Department of Health and Social Security.** Noise and vibration (DHSS Engineering Data Sheet DH1). London, DHSS, 1977. 24pp.
14. **Department of Health and Social Security.** Health building engineering installations: commissioning and associated activities (Health Technical Memorandum 17). London, HMSO, 1978. 6pp.
15. **British Standards Institution.** BS 6540: Air filters used in air conditioning and general ventilation. Part 1, 1985. Methods of test for atmospheric dust spot efficiency and synthetic dust weight arrestance. 32pp.
16. **Department of Health and Social Security.** Health Service Development — Pollution of operating departments, etc by anaesthetic gas. HC(76)38. London, DHSS, 1976.
17. **Department of Health and Social Security.** Ventilation of operating departments — a design guide (also produced as DHSS Engineering Data Sheet DV 4.1/91). London, DHSS, 1983. 91pp.
18. **Department of Health and Social Security and Welsh Office.** Cold water supply: storage and mains distribution (Health Technical Memorandum 27). London, HMSO, 1978. 74pp.
19. **Department of Health and Social Security and Welsh Office.** The control of Legionellae in health care premises services systems — a code of practice. London, HMSO, 1988.
20. **British Standards Institution.** BS 5306: Fire extinguishing installations and equipment in premises. Part 1, 1976 (1983). Hydrant systems, hose reels and foam inlets. 20pp.
21. **British Standards Institution.** BS 5423: 1980. Specification for portable fire extinguishers. 24pp.
22. **Department of Health and Social Security and Welsh Office.** Piped medical gases, medical compressed air and medical vacuum installations (Health Technical Memorandum 22). London, HMSO, 1977. 62pp.
23. **British Standards Institution.** BS 6384: 1987. Specification for active anaesthetic gas scavenging systems. 12pp.
24. **Institution of Electrical Engineers.** Regulations for electrical installations. 15th edition. IEE, 1981. 216pp (plus subsequent amendments).
25. **Department of Health and Social Security and Welsh Office.** Electrical services: supply and distribution (Health Technical Memorandum 7). London, HMSO, 1977. 48pp.
26. **Ministry of Health.** Abatement of electrical interference (Hospital Technical Memorandum 14), London, HMSO, 1965. 26pp.
27. **British Standards Institution.** BS 5394: 1983. Specification for radio interference limits and measurements for luminaires using tubular fluorescent lamps and fitted with starters. 12pp.
28. **Chartered Institution of Building Services Engineers.** Lighting Guide: hospitals and health care buildings. Publication No. 12. CIBSE, 1979. 80pp.
29. **British Standards Institution.** BS 4533. Luminaires.
30. **Department of Health and Social Security.** Electrical lighting specification for good colour rendering fluorescent light source suitable for hospital lighting (Hospital Service Engineering Data Sheet DE 2.1, Issue 4). London, DHSS, 1987. 5pp.
31. **Department of Health and Social Security.** Health Services Management. Low energy fluorescent lighting with good colour rendering properties (HN(85)20) London, DHSS, 1985. 3pp. (In Wales CAWO(85)3).
32. **Department of Health and Social Security and Welsh Office.** Common activity spaces — Volume 2: Corridors (Health Building Note 40). London, HMSO, 1986. 121pp.
33. **British Standards Institution.** BS 4533: Luminaires:
Section 102.55, 1986. Specification for luminaires for hospitals and health care buildings. 20pp.
Section 103.2, 1986. Specification for photometric characteristics of luminaires for hospitals and health care buildings. 16pp.
34. **Department of Health and Social Security.** Health services management. Misuse of drugs Regulations 1973 (HC(77)16). London, DHSS, 1977. 3pp.
35. **Department of Health and Social Security and Welsh Office.** Fitted storage system (Health Technical Memorandum 63). London, HMSO, 1986. 32pp.
36. **British Standards Institution.** BS 2881:1969: Specification for hospital cupboards (wall-fixing) for poisons and dangerous drugs. 24pp.
37. **British Standards Institution.** BS 5724: Medical electrical equipment: Part 1, 1979. Specification for general safety requirements. 220pp.
38. **Department of Health and Social Security and Welsh Office.** Emergency electrical services (Hospital Technical Memorandum 11). London, HMSO, 1974. 37pp.
39. **British Standards Institution.** BS 5266: Emergency lighting: Part 1, 1975. Code of practice for the emergency lighting of premises other than cinemas and certain other specified premises used for entertainment. 24pp.
40. **Ministry of Health.** Patient/nurse call systems (Hospital Technical Memorandum 15). London, HMSO, 1966. 28pp.
41. **Department of Health and Social Security.** Bedhead Services (DHSS Engineering Data Sheet DU 3.1). London, DHSS, 1986. 36pp.
42. **Ministry of Health.** Staff location systems (Hospital Technical Memorandum 20). London, HMSO, 1968. 10pp.
43. **Department of Health and Social Security.** Lightning protection for hospitals (Hospital Service Engineering Data Sheet DB2). London, DHSS, 1971. 15pp.
44. **British Standards Institution.** BS 5572: 1978: Code of practice for sanitary pipework. 60pp.
45. **Department of Health and Social Security.** Horizontal and vertical drainage — access and accommodation (Hospital Service Engineering Data Sheet EA5). London, DHSS, 1978. 19pp.
46. **Department of Health and Social Security.** Guide to radioactive waste disposal in hospitals (Hospital Service Engineering Data Sheet NZ 1.1 to 1.11). London, DHSS, 1978. 11pp.

7 Cost Information

Introduction

7.1 For all types of health buildings it is clearly of vital importance that building costs and revenue expenditure should be kept as low as possible consistent with acceptable standards. Within this general context building notes provide a synopsis of accommodation for health buildings which the Department, in conjunction with the National Health Service, recommends for the provision of a given service.

Cost allowance

7.2 To prepare the cost allowance for a scheme reference should be made to the current edition of Appendix 7 to Hospital Building Procedure Note 6 — Capricode. The total Departmental Cost Allowance for any scheme is derived by aggregating the cost of the functional units together with any Essential Complimentary Accommodation and Optional Accommodation/Services appropriate to the particular scheme. An example is given in the Health Notice associated with this Note.

7.3 The cost allowance covers the building and engineering guidance set out in this Note. In the costing of the functional units it has been assumed that they will be incorporated into a whole hospital to form a complete department.

7.4 The functional units for this Note are:

10,000 Attendances per annum
20,000 " " "
30,000 " " "
50,000 " " "
70,000 " " "

The activity spaces for each functional unit are listed in the 'basic' accommodation schedules at the end of this Chapter.

Dimensions and areas

7.5 In determining spatial requirements the essential factor is not the total area provided but the critical dimensions, ie those dimensions critical to the efficient functioning of the activities which are to be carried out. There are therefore no recommended areas associated with the schedules of activity spaces. To assist project teams in preparing detailed design solutions for the rooms and spaces, the Department has carried out studies to establish dimensional requirements in the form of critical dimensions. The results of these studies appear as ergonomic diagrams in the Appendix to this Note and in Health Building Note 40 'Common Activity Spaces', Volumes 1 and 2.

7.6 It is recognised that for development planning and at the earliest stage of a departmental design it may be convenient for designers to have data available which enables them to make an approximate assessment of the sizes involved. For this reason the schedules of areas, prepared for the purpose of establishing the cost allowance, are included with the Health Notice promulgating the Departmental Cost Allowance for this Note. It is emphasised that the areas published DO NOT represent recommended rooms sizes nor specific individual entitlements.

Circulation

7.7 The schedule of areas used for costing will have an area for circulation, within each functional unit, shown as an addition. It should be noted that for convenience the areas allowed for planning provision, engineering zone and for partitions are included in the area allowed for circulation.

Essential Complementary Accommodation (ECA)

7.8 This comprises activity spaces which are essential to the running of the department but which in certain circumstances may be available in a convenient location elsewhere in the hospital. The amount of ECA which will need to be provided as part of an individual project will therefore vary according to the extent of the provision available elsewhere. The ECA costed in this Note is listed in the schedule at the end of this chapter.

Optional accommodation/Services (OAS)

7.9 This Note draws attention to alternative ways of providing services or facilities including the likely cost implications. This information will enable project teams to select the solution which is most suitable to their needs. The OAS costed in this Note is listed in the schedule at the end of this chapter.

Communications — Plant space

7.10 Plant rooms, with the exception of an electrical switchroom and a room for gas cylinders, are not included in the DCA.

Engineering services

7.11 The following engineering services as described in the Engineering Chapter and exemplified in Activity Data are included in the cost allowance for this department. Primary engineering services are assumed to be conveniently available at the boundary of the department.

a. ***Mechanical services***

Heating:
Low pressure hot water system with zone control for aspect. Maximum touch temperature generally 82°C, except 43°C in children's waiting/play area.

Ventilation:
In areas other than the major treatment suite will be mainly natural, but with mechanical supply and extract to meet clinical and functional requirements.

Air-conditioned ventilation:
To major treatment suite (major treatment and major treatment/plaster rooms, associated clean utility and resuscitation room). Cooling plant included.

Cold water service:
Centrally supplied to service points, including drinking water and fire hose reels. Storage tanks excluded.

Hot water service:
Centrally supplied to service points. Storage excluded.

Medical gases:
Piped supplies of oxygen, nitrous oxide, vacuum and compressed air from the hospital centralised systems. Waste gas scavenging system in each major treatment room, and major treatment/plaster room.

b. ***Electrical services***
Departmental distribution switchboard.

General lighting as required by tasks.

Flourescent, tungsten, safety and emergency luminaires as appropriate. Dimming included for ENT/Ophthalmic room.

Socket outlets and other power outlets for fixed and portable equipment. Supplementary equipotential earth bonding connections. Stand-by and safety installations from the main hospital supplies. 'No break' supply system for minor operating luminaires in major treatment rooms.

Intercommunication system.

Patient/Staff and Staff/staff call system.

Fire, security, medical gases and drug cupboard alarm systems.

Impulse clocks.

Staff location extensions to the hospital system.

Telephone and data transmission conduits only.

c. ***Equipment (Group 1)***
Minor operating theatre table luminaires in major treatment and major treatment/plaster rooms. Fixed pendants for medical gases, scavenging and socket outlets in major treatment rooms.

X-Ray viewers and operating theatre — type control panels in major treatment rooms.

Medical examination luminaires in consulting rooms and stretcher bays.

Schedules of Accommodation

Attendances per annum		10,000		20,000		30,000		50,000		70,000	
Activity space	*Space Area m²*	*Qty.*	*TOTAL AREA m²*	*Qty.*	*TOTAL AREA m²*	*Qty.*	*TOTAL AREA m²*	*Qty.*	*TOTAL AREA m²*	*Qty.*	*TOTAL AREA m²*
PATIENTS' AREAS											
Lobby/Main Entrance	–	1	8.00	1	8.00	1	14.00	1	14.00	1	14.00
Reception	–	1	16.00	1	20.00	1	24.00	1	14.00	1	17.50
Main waiting	–	1	20.00	1	30.00	1	35.00	1	40.00	1	52.50
Treatment sub-wait	–	–	–	–	–	1	6.00	1	10.50	1	15.00
Childrens' Play area	–	1	8.50	1	8.50	1	8.50	1	8.50	1	10.00
Interview Room	9.00	1	9.00	1	9.00	1	9.00	1	9.00	2	18.00
CLINICAL AREAS											
Consulting/Examination	15.00	1	15.00	1	15.00	1	15.00	2	30.00	3	45.00
Patient cleansing	11.00	1	11.00	1	11.00	1	11.00	1	11.00	1	11.00
Resuscitation	17.00	2	34.00	2	34.00	2	34.00	3	51.00	4	68.00
Ambulant cubicles	8.50	–	–	3	25.50	3	25.50	3	25.50	5	42.50
Stretcher cubicles	9.50	1	9.50	1	9.50	2	19.00	3	28.50	4	38.00
ENT/Ophthalmic cubicles	10.50	1	10.50	1	10.50	1	10.50	1	10.50	1	10.50
Stretcher room	12.50	1	12.50	1	12.50	2	25.00	3	37.50	3	37.50
Drugs/Alchohol recovery	8.50	–	–	–	–	1	8.50	1	8.50	1	8.50
Major Treatment Room	19.00	–	–	–	–	1	19.00	1	19.00	1	19.00
Major Treatment plaster room	25.00	1	25.00	1	25.00	1	25.00	1	25.00	1	25.00
SANITARY FACILITIES											
Patients' WC	2.00	2	4.00	2	4.00	2	4.00	2	4.00	4	8.00
Wheelchair/Specimen WC	4.50	1	4.50	1	4.50	1	4.50	2	9.00	2	9.00
Child/Nappy change WC	4.00	1	4.00	1	4.00	1	4.00	1	4.00	1	4.00
Staff WC	2.00	1	2.00	1	2.00	1	2.00	1	2.00	2	4.00
Staff shower	3.00	1	3.00	1	3.00	1	3.00	1	3.00	1	3.00
STAFF FACILITIES											
Staff base and supplies base	–	1	20.00	1	30.00	1	30.00	1	44.00	1	50.00
Consultant's office	9.50	–	–	–	–	1	9.50	1	9.50	1	9.50
Sister/Charge nurse's office	9.00	1	9.00	1	9.00	1	9.00	1	9.00	1	9.00
Secretarial office	–	–	–	–	–	–	–	1	10.50	1	13.00
Duty/Overnight stay	8.00	–	–	–	–	1	8.00	1	8.00	1	8.00
Porter's base	9.00	–	–	–	–	1	9.00	1	9.00	1	9.00
Staff rest room	–	1	8.00	1	12.00	1	12.00	1	15.00	1	15.00
Staff lockers	–	2	11.00	2	11.00	2	11.00	2	11.00	2	16.00
STORES AND UTILITY ROOMS											
Clean utility	8.00	1	8.00	1	8.00	1	8.00	1	8.00	1	8.00
Dirty utility/WC specimen	8.50	1	8.50	1	8.50	1	8.50	1	8.50	1	8.50
Dirty utility/Treatment suite	8.50	–	–	–	–	1	8.50	1	8.50	1	8.50
Disposal/Holding room	–	1	4.00	1	4.00	1	4.00	1	4.00	1	6.00
Cleaner's room	–	1	6.00	1	6.00	1	6.00	1	7.50	1	7.50
Switchroom	2.00	1	2.00	1	2.00	1	2.00	1	2.00	1	2.00
Main Store	–	1	16.00	1	16.00	1	16.00	1	20.00	1	22.00
Major incident equipment store	5.00	1	5.00	1	5.00	1	5.00	1	5.00	1	5.00
Decontamination equipment store	1.00	1	1.00	1	1.00	1	1.00	1	1.00	1	1.00
Crutches and splint store	–	–	–	1	7.50	1	7.50	1	7.50	1	10.00
Sterile supplies store	–	–	–	–	–	–	–	1	5.00	1	7.00
Trolley parking	4.00	1	4.00	1	4.00	1	4.00	1	4.00	2	8.00
Gas cylinders store	–	1	4.00	1	4.00	1	4.00	1	8.50	1	8.50
NETT TOTAL			303.00		364.00		469.50		570.00		691.50
CIRCULATION, ETC			128.00		154.00		198.50		241.00		292.00
TOTAL			431.00		518.00		668.00		811.00		983.50
DEPARTMENTAL AREAS			430m²		520m²		670m²		810m²		985m²

ESSENTIAL COMPLEMENTARY ACCOMMODATION

Activity space	*Quantity*	*Usable* m^2	*Total including circulation, etc* m^2
Recovery (1 bed)	1	8.0	11.5
Nursing officer's office	1	9.0	12.0
Staff changing (male)	1	8.0	11.5
Staff changing (female)	1	17.0	24.0

OPTIONAL ACCOMMODATION/SERVICES

Activity space	*Quantity*	*Usable* m^2	*Total including circulation, etc* m^2
Major treatment room	1	19.0	27.0

8 Activity Data

Introduction

8.1 The expression 'Activity Data' refers to an information system developed to help project and design teams by defining the 'users' needs more precisely. This information constitutes the Activity Data Base, which was issued to Regional Health Authorities in England and to the Health Departments in Scotland, Northern Ireland and Wales in 1976. It comprises two types of information sheet: Activity Space Data Sheets (know as 'A' sheets) and their supporting Activity Unit Data Sheets (known as 'B' sheets).

8.2 'A' sheets record in more detail than is described in this Note each task or activity that is performed in a particular activity space (which may be a room, space or bay) together with details of the environmental conditions and the technical data necessary to enable the activities to be performed. Each 'A' sheet also contains a list of the titles and code numbers of the relevant 'B' sheets.

8.3 'B' sheets provide narrative text and graphics to scale relating to one activity. They show equipment fitted or supplied as part of the building, and the necessary engineering terminals. There are also 'component B sheets' which show a range of particular components rather than an activity.

8.4 Further information about the use and preparation of Activity Data can be found in the 'Guide to 'A' and 'B' Activity Data Sheets and their use in Health Building Schemes' which was issued to Regional Health Authorities in June 1980 and to NHS Authorities in Wales in November 1980. Copies of the Guide are available from the Department's Health Building Directorate, Euston Tower, 286 Euston Road, London NW1 3DN.

Activity Data applicable to this Note

8.5 The 'A' and 'B' sheets recommended for the activity spaces described in this Note are either new sheets, amended ones, or selected from existing sheets. Their code numbers and titles are provided on the lists which follow.

8.6 Further Activity Data Sheets may be selected, or drawn up by project teams to their own requirements, for any services not described in the Note or included in the list. Members of project teams are advised to contact their Regional Activity Data Co-ordinator/Welsh Office for information and advice about the selection of activity data, at an early planning stage. However, in order to ensure consistent and economic provision, variations from the 'A' sheets recommended for the spaces covered in this Note should be considered only where it has been decided that the function of a space will substantially differ from that described.

List of Activity Data 'A' Sheets

NOTE: If no number is shown, the number from the previous column is the appropriate one. A dash indicates 'not applicable'.

Activity space	*'A' Sheet code number for attendances of*					*Paragraph number in HBN*
	10,000	*20,000*	*30,000*	*50,000*	*70,000*	
PATIENT AREAS						
1. Draught lobby — main entrance	J 0109					4.4
2. Reception/records/typing	J 0414	J 0415	J 0416	J 0417	J 0418	4.5
3. Main waiting	J 1123	J 1124		J 1125	J 1126	4.6
4. Treatment sub-wait	–	–	J 1206	J 1204	J 1201	4.13
5. Children's play area	J 1407				J 1408	4.6
6. Interview room	M 0710					4.35
CLINICAL AREAS						
7. Consulting/Examination	C 0101					4.7
8. Patient cleansing	V 1617					4.9
9. Resuscitation	X 0215			X 0201	X 0216	4.10
10. Treatment cubicles — ambulant	C 0605					4.14
11. Treatment cubicles — stretcher	C 0607					4.15
12. ENT/Ophthalmic cubicles	C 0606					4.14
13. Stretcher room	C 0604					4.16
14. Drugs/Alcohol recovery	–	–	X 0503			4.18
15. Major treatment/Plaster room	X 0203					4.23
16. Major treatment room	–	–	X 0202			4.25
17. Recovery /Rest	–	–	X 0509	X 0510	X 0511	4.29
SANITARY FACILITIES						
18. Patients WC	V 1106					4.6
19. Patients WC — Wheelchair	–	–	–	*V 1204		4.6
20. Patients WC — Wheelchair/Specimen	V 1403					4.21
21. Child/Nappy change WC	V 1213					4.6
22. Staff WC	*V 1005					4.37
23. Staff shower	V 1605					4.39
STAFF FACILITIES						
24. Staff base/Supplies base	T 0111	T 0112	T 0113	T 0114	T 0115	4.19/20
25. Medical office	–	–	M 0304			4.33
26. Sister/Charge nurse office	*M 0201					4.31
27. Secretarial office	–	–	–	M 1308	M 1303	4.34
28. Duty/Overnight stay	–	–	M 0901			4.39
29. Porters base	–	–	M 1705			4.8
30. Staff rest room	D 0505	D 0503		D 0506		4.36
Staff lockers —						
31. Central change — Male	V 0602				V 0603	4.37
32. Central change — Female	V 0617				V 0607	4.37
33. Local change — Male	V 0408				V 0409	4.37
34. Local change — Female	V 0410				V 0411	4.37
STORES AND UTILITY ROOMS						
35. Clean utility	T 0511					4.27
36. Dirty utility/WC specimen	Y 0401					4.21
37. Dirty utility (treatment area)	–	–	Y 0405			4.28
38. Disposal/Holding	*Y 0603					4.45
39. Cleaners space	*Y 1501					4.44
40. Switchroom	K 0101					4.48
41. Main store	W 1304					4.40
42. Major incident equipment store	W 1303					4.41
43. Decontamination equipment store	W 1305					4.42
44. Crutches and splint store	W 1302					4.44
45. Sterile supplies	–	–	–	W 1309		4.45
46. Trolley parking	M 1705					4.48
47. Gas cylinder store	W 1306					4.43

***See HBN 49 'Common Activity Spaces', Volume 1.**

'B' Sheet Code No	*Activity Unit Title*
A 02AH	CLEANSING Clinical handwashing
A 02AU	CLEANSING Clinical handwashing, scrub-up trough, 2 places
A 02AW	CLEANSING Clinical handwashing, scrub-up trough, 1 place
A 03AA	CLEANSING/STORAGE Changing, 5 apron hooks and boot rack
A 05BT	PREPARATION/STORAGE Controlled Drugs and medicines, 2 cupboards, fridge (no trolley)
A 05BX	PREPARATION/STORAGE Controlled Drugs and medicines, supply base
A 05BY	PREPARATION/STORAGE Controlled Drugs and medicines, supply base, 30,000 attendances A and E
A 19AE	SUPERVISION/CONTROL Staff base, A and E
A 19AI	SUPERVISORY/CONTROL Staff base, ward
A 22AK	EXAMINATION Assessment of refraction test at 3 metres
A 22AL	EXAMINATION Clinical examination area with couch
A 24BM	TREATMENT Clinical treatment area with trolley
A 24BQ	TREATMENT Clinical treatment area with trolley and equipment rails
A 24BR	TREATMENT Clinical treatment area, plaster application and pendant services
A 25AC	RESUSCITATION Resuscitation area, wall-mounted services, equipment rails
A 27AA	ASSESSMENT X-Ray illuminator, single, wall-mounted
A 27AB	ASSESSMENT Viewer X-Ray film, double, wall-mounted
A 27AQ	ASSESSMENT X-Ray illuminator, single, portable
A 27AR	ASSESSMENT X-ray illuminator triple, wall-mounted and writing shelf
A 29AL	HOLDING/TESTING urine testing
A 33AF	OPERATIVE PROCEDURES Surgeon's platform
A 33BC	OPERATIVE PROCEDURES Parking, ophthalmic magnet with surge control
A 33CE	OPERATIVE PROCEDURES Control panel, major treatment room, rear or front access
A 34AL	RECOVERY General area with trolley and chair
A 38AD	ANAESTHENIA General anaesthetic apparatus trolley
A 38AP	ANAESTHENIA Storage, cupboards drugs and anaesthetic sundries
B 01BD	CHANGING Cubicle, curtained
B 02BM	CLEANSING Sink unit with 2 shelf tier, 900 × 300 mm
B 02CA	CLEANSING Hose 6 m and reel, wall-mounted
B 04AM	STORAGE Safe, small
B 04BY	STORAGE Cupboard 1800 × 900 × 450 mm, steel, lockable
B 04IB	STORAGE Bin, mobile, plastic
B 04KB	STORAGE Cupboard, stationery, 900 × 900 × 450 mm
B 04NL	STORAGE Cupboard, stationery, 1800 × 900 × 450 mm, shutter front, lockable
B 04QD	STORAGE Elbow crutch rail
B 05CE	PREPARATION/STORAGE Worktop 1800 × 600 mm drawer unit and cupboard under
B 05CF	PREPARATION/STORAGE Cupboard 800 × 1200 × 500 mm, lockable, with worktop
B 06CI	PREPARATION Beverages, incidental
B 06CK	PREPARATION Drinking water dispenser unit
B 06CN	PREPARATION Beverages, paper cup dispenser
B 08AO	HOLDING/DISPOSAL Dirty Utility
B 09AC	DISPOSAL Liquid Waste
B 09BJ	DISPOSAL Plaster sink
B 11AQ	RECEPTION Counter, accident and emergency, main waiting
B 14AD	ADMINISTRATION Desk, double pedestal with chair, telephone and socket outlet
B 14AQ	ADMINISTRATION Desk, single pedestal with chair, and socket outlet
B 14AX	ADMINISTRATION Desk, single pedestal with modesty screen, chair, telephone and socket outlet
B 14AY	ADMINISTRATION Desk, single pedestal with chair, telephone and socket outlet
B 15AI	SECRETARIAL Desk unit with telephone and socket outlet
B 16AB	COMMUNICATION Telephone, coin operated
B 16AN	COMMUNICATION Telephone, low height, coin operated
B 20AL	RECORDING Writing flap 600 × 400 mm
B 26AA	REST Overnight stay
B 27AV	TOILET WC, staff, female

LIST OF ACTIVITY DATA 'B' SHEETS

'B' Sheet Code No	*Activity Unit Title*
B 27AY	TOILET WC, child
B 27BA	TOILET Personal washing
B 27EE	TOILET Shower, staff, without personal washing facilities
B 27EJ	TOILET WC, personal washing, patient categories 1–3
B 27EL	TOILET WC Wheelchair, specimen collection and hand-rinse basin
B 27EW	TOILET WC wheelchair and personal washing
B 27FN	TOILET Shower, patient, industrial contamination
B 31AK	PARKING Lamp, scialytic mobile
B 31AQ	PARKING Ventilator, mechanical cabinet, mobile
B 31AR	PARKING Infusion stand, twin hook, mobile
B 31BH	PARKING Plaster bucket stand, mobile
B 31BL	PARKING Lamp, examination, mobile
B 31CO	PARKING Portable suction jars pipeline
B 31CR	PARKING Kickabout, 350 m diameter
B 31EA	PARKING Steps, 3 tread, mobile
B 31FC	PARKING Lamp, examination ENT portable
B 42AE	INFORMATION DISPLAY Location index board 1200 × 1800 mm
B 43AA	GROOMING Mirror 600 × 300 mm, wall-mounted, with shelf under
B 52AA	CLEANSING Sink unit
C 01CB	CLOTHES Storage locker, clothes, twin, 1800 × 600 × 530 mm
C 01EF	CLOTHES STORAGE Wardrobe, steel cupboard, clothes hanging, 1800 × 900 × 450 mm
C 01GA	CLOTHES STORAGE Locker, Small, wall-mounted, 300 × 300 mm
C 01GC	CLOTHES STORAGE Locker, small, wall-mounted
C 01GD	CLOTHES STORAGE Locker, small, wall-mounted
C 01HA	CLOTHES STORAGE Stand, hat, coat and umbrella 12 hangers
C 01IE	CLOTHES STORAGE hat, coat, shoe rack, with coat security, 15 coats
C 01IF	CLOTHES STORAGE hat, coat, shoe rack, with coat security, 5 coats
C 01JA	CLOTHES STORAGE stand, hat, coat and umbrella, 10 hangers with security, freestanding
C 03CB	STORAGE Hook, hat and coat, two
C 03CC	STORAGE Hook, hat and coat, three
C 03CD	STORAGE Hook, hat and coat, four
C 03CG	STORAGE Hook, hat and coat, seven
C 03CH	STORAGE Hook, hat and coat, eight
C 03EB	STORAGE Hook equipment, wall-mounted
C 03GI	STORAGE Clip, spring, 32 mm diameter
C 04CA	CHAIR Stacking
C 04CB	CHAIR chair, upright, with arm, stacking
C 04CG	CHAIR chair, easy, with open arms, low back
C 04CH	CHAIR, chair, easy, with open arms, high back
C 04CI	CHAIR chair, easy, unit
C 04DB	CHAIR chair, child, upright, seat height 390 mm, stacking
C 04GD	CHAIR, Wheelchair, folding, attendant propelled
C 07DA	BENCH SEATING Seating, banquette, 400 × 1800 × 600 mm
C 07DB	BENCH SEATING Seating, banquette, 400 × 1200 × 600 mm
C 07EA	BENCH SEATING 450 × 1200 × 450 mm with shoe rack
C 09CD	TABLES Table, 710 × 900 × 600 mm
C 09FA	TABLES Table, occasional square, 400 × 600 × 600 mm
C 09FC	TABLES Table, occasional, 530 × 840 × 455 mm, with shelf
C 12CB	DISPOSAL CONTAINERS Holder, sack, medium, freestanding
C 12CC	DISPOSAL CONTAINERS Holder, sack, large, freestanding
C 12DB	DISPOSAL CONTAINERS Holder, sack, medium, foot operated, freestanding
C 12EC	DISPOSAL CONTAINERS sack holder, mobile, large
C 12HA	DISPOSAL CONTAINERS Ashtray, pedestal
C 13CE	BOOK STORAGE Bookcase, standing, 1200 mm long, wood doors, 4 shelves
C 13DB	BOOK STORAGE Shelf, wall-mounted, 600 × 200 mm
C 17CA	MIRRORS Mirror, wall-mounted, 1500 × 400 mm
C 17CB	MIRRORS Mirror, wall-mounted, 600 × 300 mm
C 18CA	DISPLAY PANEL Panel, display, wall-mounted, 800 × 600 mm

LIST OF ACTIVITY DATA 'B' SHEETS

'B' Sheet Code No	*Activity Unit Title*
C 18CB	DISPLAY PANEL Panel, display, wall-mounted, 800 × 1200 mm
C 18CC	DISPLAY PANEL Panel, display, wall-mounted, 1200 × 600 mm
C 19DB	CHALKBOARDS Chalkboard, wall-mounted, 800 × 1200 mm
C 20CD	MARKER BOARD Wall-mounted, 1200 × 600 mm
C 23CA	DOCUMENT STORAGE Cabinet, filing, 2 drawer
C 23CB	DOCUMENT STORAGE Cabinet, filing, 4 drawer
C 23DE	DOCUMENT STORAGE Card index, 6 double drawer, 152 × 229 mm
C 23DF	DOCUMENT STORAGE Card index, 11 drawer, 127 × 76 mm
C 23HA	DOCUMENT STORAGE Rack, stationery, wall-mounted
C 27DA	STOOLS/RESTS Stool, surgeon, adjustable
C 31CH	TROLLEYS Trolley, dressing/instrument, SS, 750 × 450 mm, buffered
C 31CI	TROLLEYS, Trolley, dressing/instrument, SS, 450 × 450 mm buffered
C 31CK	TROLLEYS Supermarket Type, with shelf
C 31DL	TROLLEYS Tea/household
C 31GA	TROLLEYS Clean linen exchange
C 31GE	TROLLEYS Soiled linen, single ring BS 2854
C 31IH	TROLLEYS Accident, X-ray top, with tilt and brakes
C 31IK	TROLLEYS Baby change, with brakes
C 31KF	TROLLEYS Trolley, cleaners
C 31KI	TROLLEYS Trolley, cylinder
C 31LA	TROLLEYS Trolley, ECG/Defibrillator about 450 × 600 mm
C 31LB	TROLLEYS Trolley, Mays
C 32BA	RACKING Wire mesh, sterile pack storage (dressings)
C 32BB	RACKING Wire mesh, sterile pack storage (catheter)
C 32CG	RACKING Metal, 1 bay, 4 shelves, 2000 × 914 × 305 mm
C 32CI	RACKING Metal, 1 bay, 4 shelves, 2000 × 914 × 457 mm
C 32DL	RACKING Medical gas cylinders
C 33CA	SHELVING Square ends, 600 × 200 mm
C 33CB	SHELVING Square ends 600 × 300 mm
C 33DA	SHELVING Square ends, 900 × 200 mm
C 33DB	SHELVING Square ends, 900 × 300 mm
C 33DJ	SHELVING Shelf right hand end splayed and rounded, 900 × 300 mm
C 33EB	SHELVING Shelf, square ends, 1200 × 300 mm
C 33EC	SHELVING Shelf, square ends, 1200 × 400 mm
C 33ED	SHELVING Shelf, square ends, 1200 × 500 mm
C 33FB	SHELVING Shelf, square ends, 1500 × 300 mm
C 33FC	SHELVING Shelf, square ends, 1500 × 400 mm
C 33FD	SHELVING Shelf, square ends, 1500 × 500 mm
C 33GB	SHELVING Shelf, square ends, 1800 × 300 mm
C 33HB	SHELVING Shelf, square ends, 2100 × 300 mm
C 33HC	SHELVING Shelf, square ends, 2100 × 400 mm
C 33NB	SHELVING Shelf, wall-mounted, adjustable PVC coated steel, perforated, 1500 × 600 mm
C 52EA	DOMESTIC CLEANING Trolley, bucket wringer
C 52EC	DOMESTIC CLEANING Machine, dry suction, industrial cylinder
C 52EG	DOMESTIC CLEANING Machine, scrubbing, polishing, industrial
C 55CB	SCREENS Screen, dividing, 1500 × 1800 mm portable
C 59EI	FIRE FIGHTING Extinguisher, fire, CO_2, 6.8 kg, wall-mounted

Appendix

Critical Dimensions

Introduction

1. Critical dimensions are those dimensions which are critical to the efficient functioning of an activity; thus the size of components, their position and the space around them may all be critical to the task being performed. Guidance on these dimensions for a particular activity is provided in the form of component-user data sheets. These illustrate components, ie equipment, furniture and fittings, and provide ergonomic data on the space required for users to move, operate or otherwise use the component; information about the component, eg fixing heights, and the users, eg reach, is also provided. Component-user data sheets thus complement the information given on Activity Data 'B' sheets. (See Chapter 8.)

2. This appendix contains sheets relevant to this Note. In addition, ergonomic data common to the design of a number of departments is contained in the Common Activity Spaces Health Building Note, HBN 40, to which reference should also be made.

Component dimensions

3. These relate to the size and position of components as follows:

a. Sizes of components are shown thus

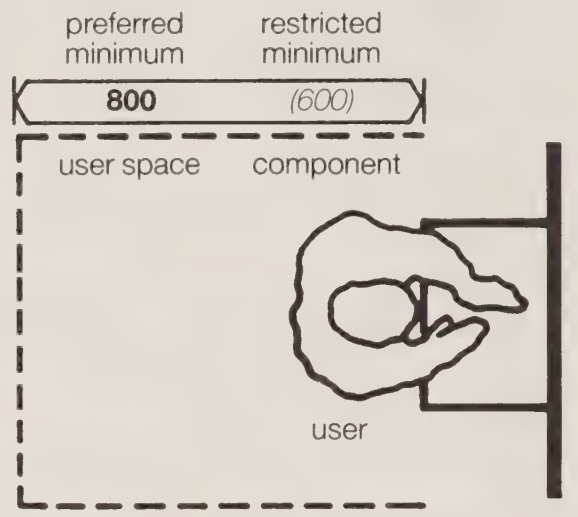
b. Preferred component fixing heights are shown as heights above floor level thus

1000
1000-1300

(In some cases an acceptable range of fixing heights is also given in italics).

Activity dimensions

4. Activity dimensions define the user space, which is the minimum space required to perform an activity. Two types of activity dimension are given:

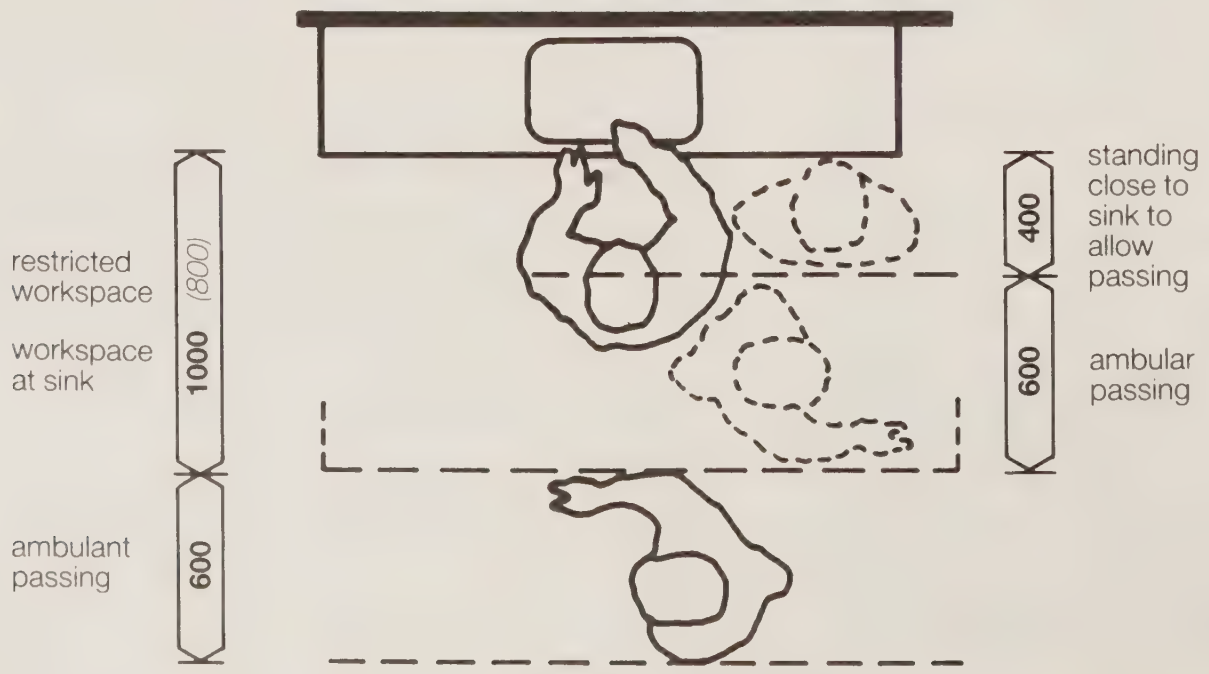


a. Preferred minimum — This defines the minimum space required to carry out an activity efficiently and is shown in bold type.

b. Restricted minimum — This will only allow the activity to be performed at the expense of the user experiencing some difficulty. It is not recommended for general application but may be appropriate when considering the overlapping that can be allowed when two user spaces are adjoining.

Selection of activity dimensions

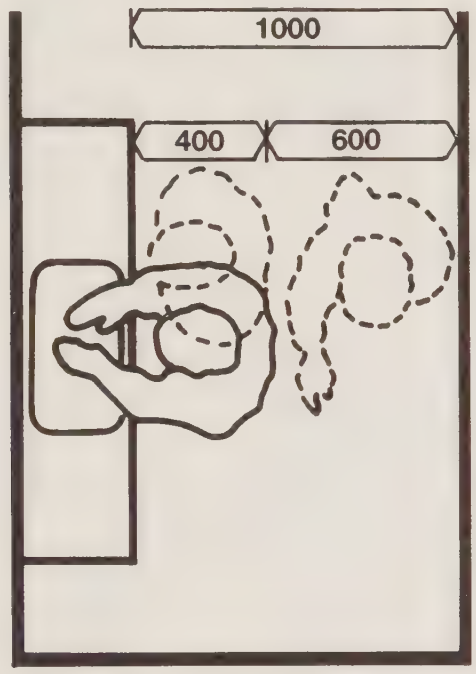
5. When using component-user data sheets to design activity space layouts, selection of the appropriate activity dimensions is essential for economy and efficiency. Selection should be based on careful consideration of the frequency, duration, timing and importance of the activities and also the number of people involved. A typical example of the use of a sink showing activity dimensions provided by the component use data sheet is shown below.



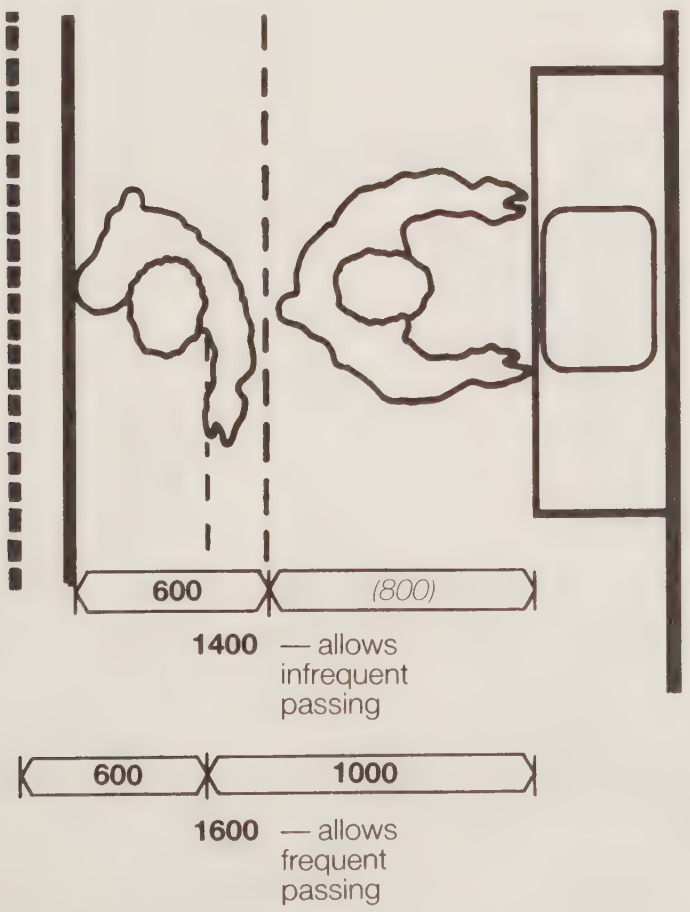
Examples

6. The following worked examples show the sink being used in three different situations and show how the appropriate dimensions would be selected. These examples have been simplified and additional factors such as the movement of mobile equipment may also be critical. The examples do not necessarily relate to this particular building guidance.

a. If the room is normally occupied by one person only the 1000 workspace dimension may be applicable. An (800) restricted dimension should not be used as this dimension is only applicable where two user spaces are adjoining, not where an individual user space is bounded by a wall or solid obstruction. If the person using the sink stops work and stands close to the sink, 1000 is also sufficient space to allow a second person to pass ie 600 + 400.

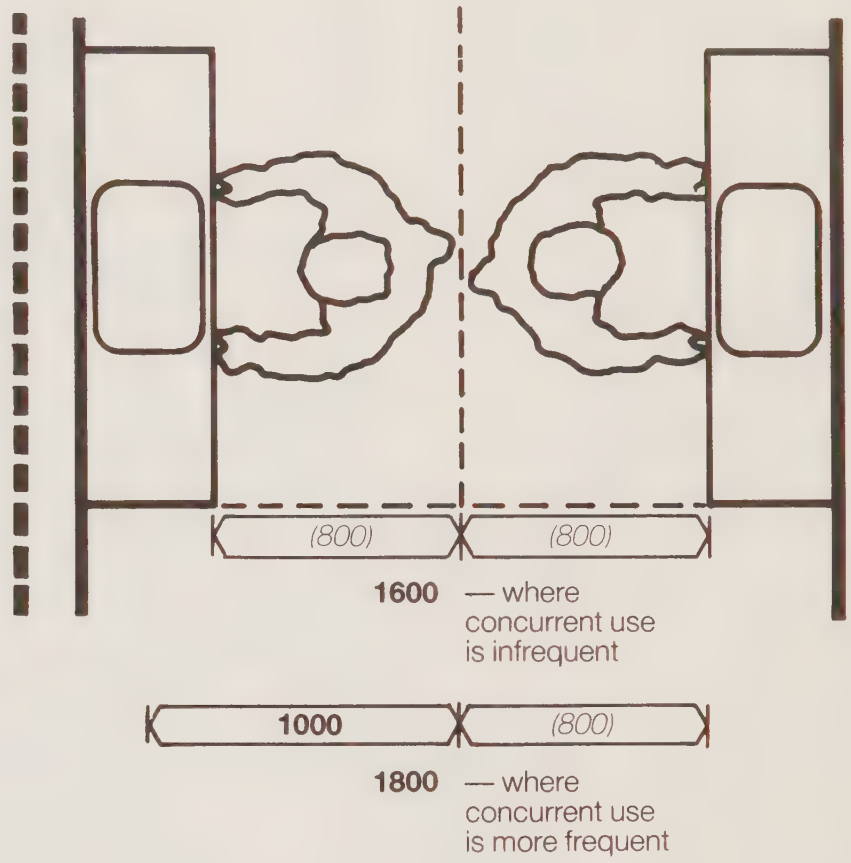


b. If space is required to allow a person to pass, without the user of the sink stopping work, then the 600 passing dimension is added to the workspace dimension. If passing is infrequent them temporary restriction of the sink user's space may be acceptable; this gives an overall dimension of 600 + (800) = 1400. If passing is frequent and restriction of the sink user's space is not acceptable the overall dimension is 600 + 1000 = 1600.



c. Where space has to be provided to enable two sinks to be used concurrently the overall dimension between sinks will be the sum of the workspace dimensions, eg if concurrent use is infrequent and of short duration then (800) + (800) = 1600 may be acceptable. Alternatively 1000 + (800) = 1800 allows the full workspace for one sink user and restricted space for the second user, where concurrent use of the sinks is more frequent.

Note. The passing of a third person between the two sink users may also be critical in this example. Where the sinks are staggered 1400 may be acceptable as in example b.



LIST OF ERGONOMIC DRAWINGS

1. Entrance lobby
2. Reception counter
3. Examination/Treatment room
4. Examination/Treatment cubicle (2 drawings)
5. Resuscitation cubicle
6. Major treatment room
7. Treatment room

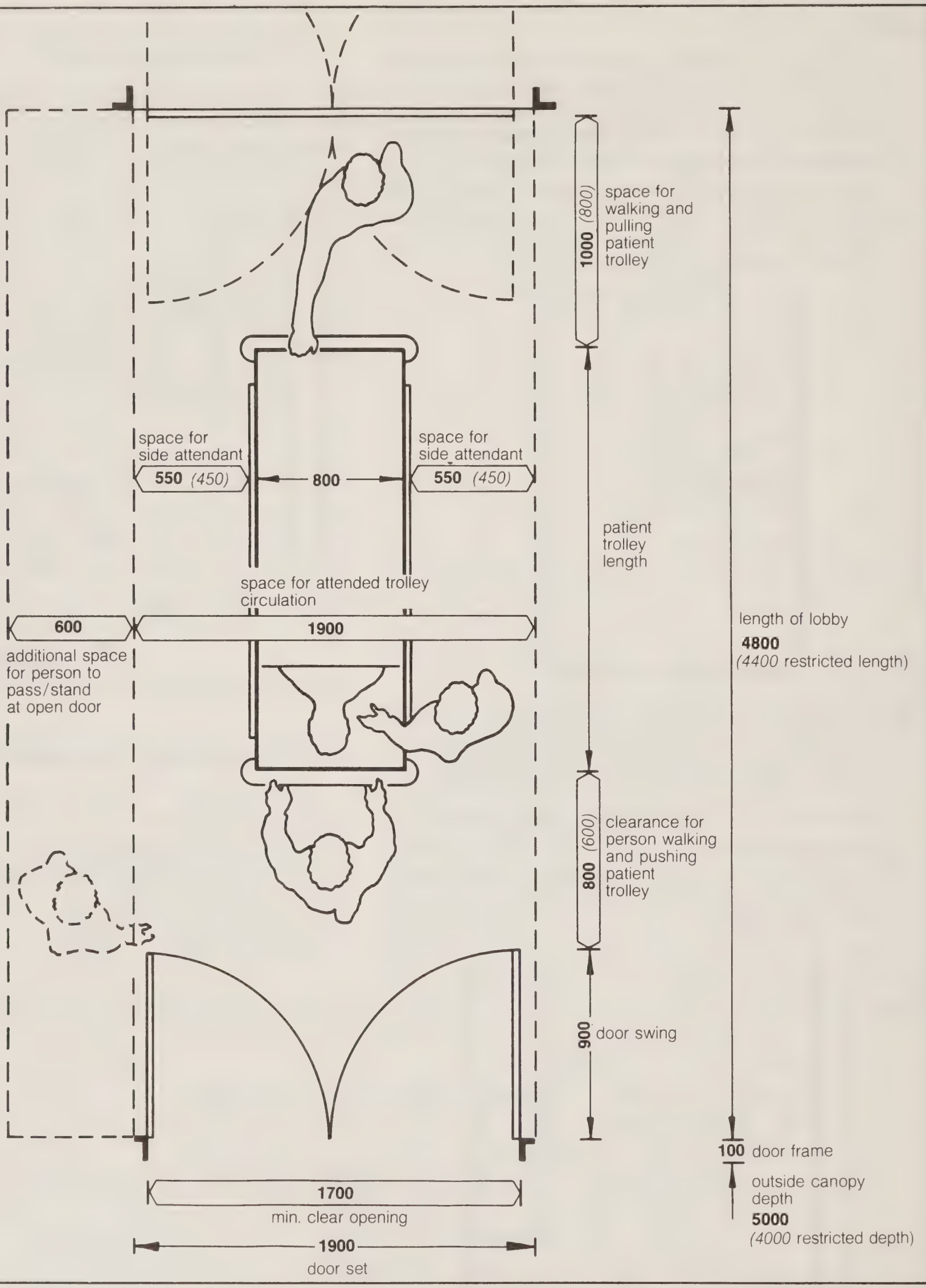
Activities:
Moving accident trolley through 2 sets of double doors which form a lobby. The lobby should allow one set of doors to close before the other set is opened to minimise draughts.

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Entrance Lobby (1)

with swing doors
Accident and emergency dept. - patient trolleys

Users:
2 persons moving trolley
Trolley with 2 side attendants



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

most critical movements to allow easy passage of patient trolley, but all exit doors should also open outwards to satisfy requirements for fire evacuation. A and E lobby doors should therefore be capable of being opened satisfactorily in both directions.

Notes:
1. Doors should always swing in direction of

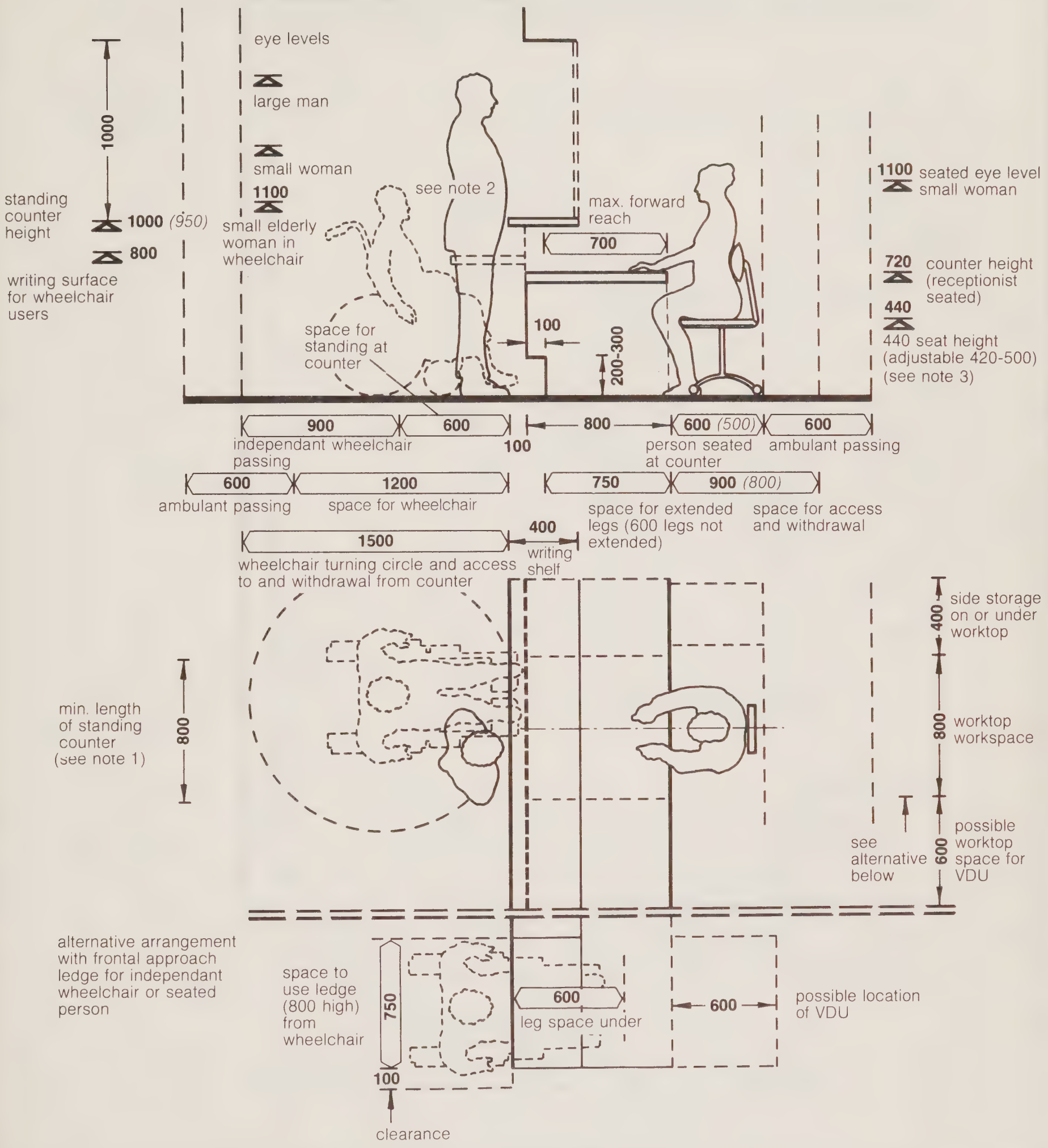
Activities:
Sitting and writing down information on forms etc , using a telephone and records (which could be on files or on a VDU) ·

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Reception Counter

Accident & Emergency

Users:
Receptionist and patient (with or without escort) patient may be ambulant semi-ambulant or in a wheelchair.



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:
1. The standing height counter would act as a physical and psycological barrier to a patient/escort who may be violent. Alternatively, or in addition a glazed screen could be used. The standing height counter acts as a ledge for putting down handbags etc and also for signing forms etc.

2. A writing surface suitable for wheelchair users should be provided. This could take the form retractable flat as shown (400 x 400) or the alternative frontal approach ledge shown.

3. Wheelchair users should be able to be seen by the seated receptionist. Visibility should therefore extend down to 720 (800) reception desk height (wheelchair writing surface height).

4. Swivel chair on castors recommended for receptionist (essential where VDU facilities are provided adjacent to desk).

Activities

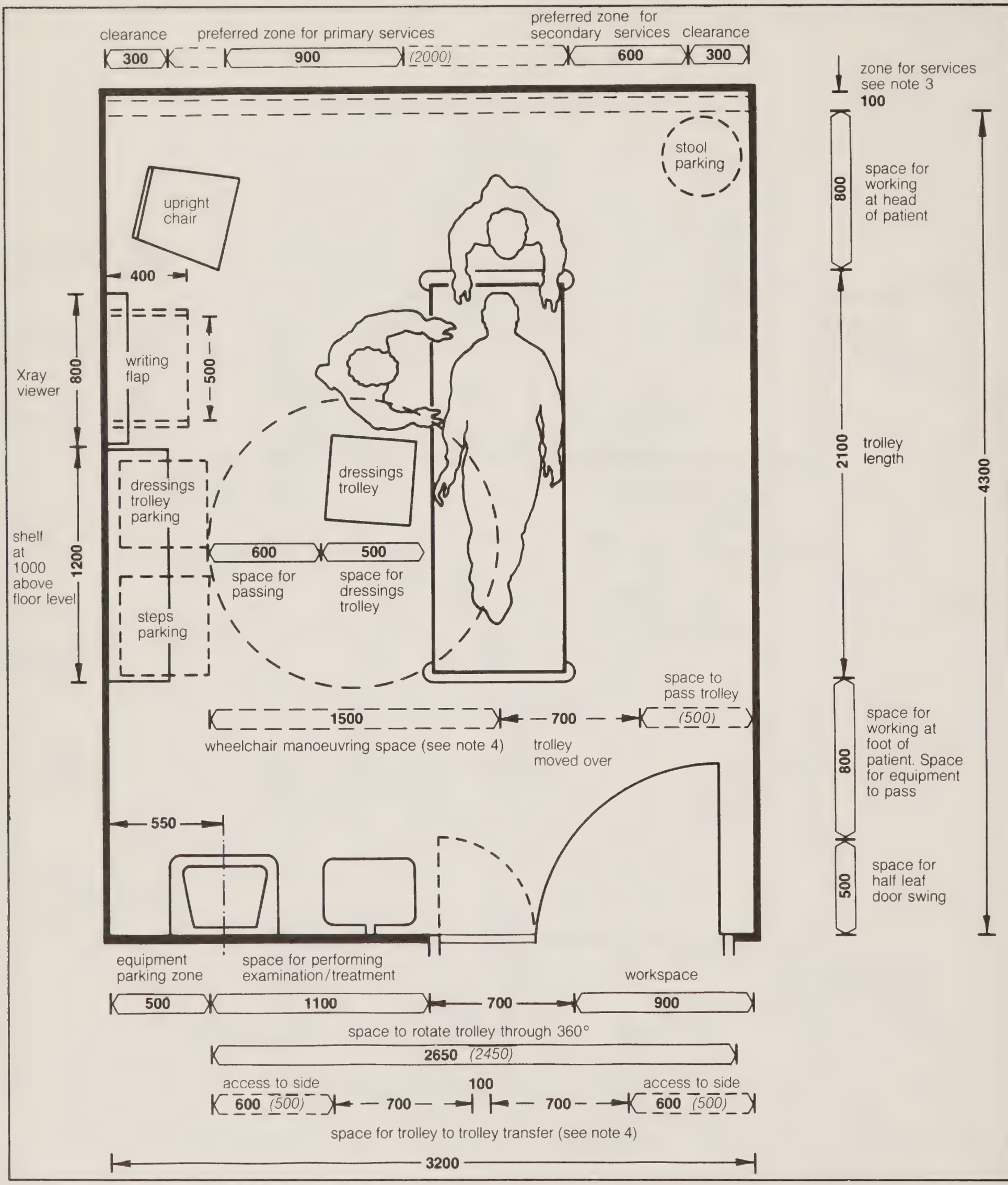
Facilities for carrying out clinical examinations and emergency medical and nursing procedures. The patient will be transported into the space on a trolley but may occasionally be transferred from a wheelchair. The patient may undress with assistance. Procedures will be performed by 1-4 staff who will carry them out from either or both sides of the trolley, or either end of the trolley. Facilities for clinical hand-washing, recording patient data, viewing, X rays, storage of dressing etc, disposal of soiled dressings should be provided.

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Examination/ Treatment Room

Accident and Emergency

Users:
Ambulant/Wheelchair



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Assisted patient undressing/dressing is likely to occur with the patient on the trolley.

2. A 1900 door set would provide better access where patient trolleys are frequently moved with attendants on both sides, but in order to provide unimpeded workspace inside the room, room length should be increased by 200-400.

3. Heights above floor level for equipment rails — 600, 1100, 1650 *(1700* max) where service outlets are at 1350.

4. Space should be provided for occasional trolley to trolley or wheelchair to trolley transfer.

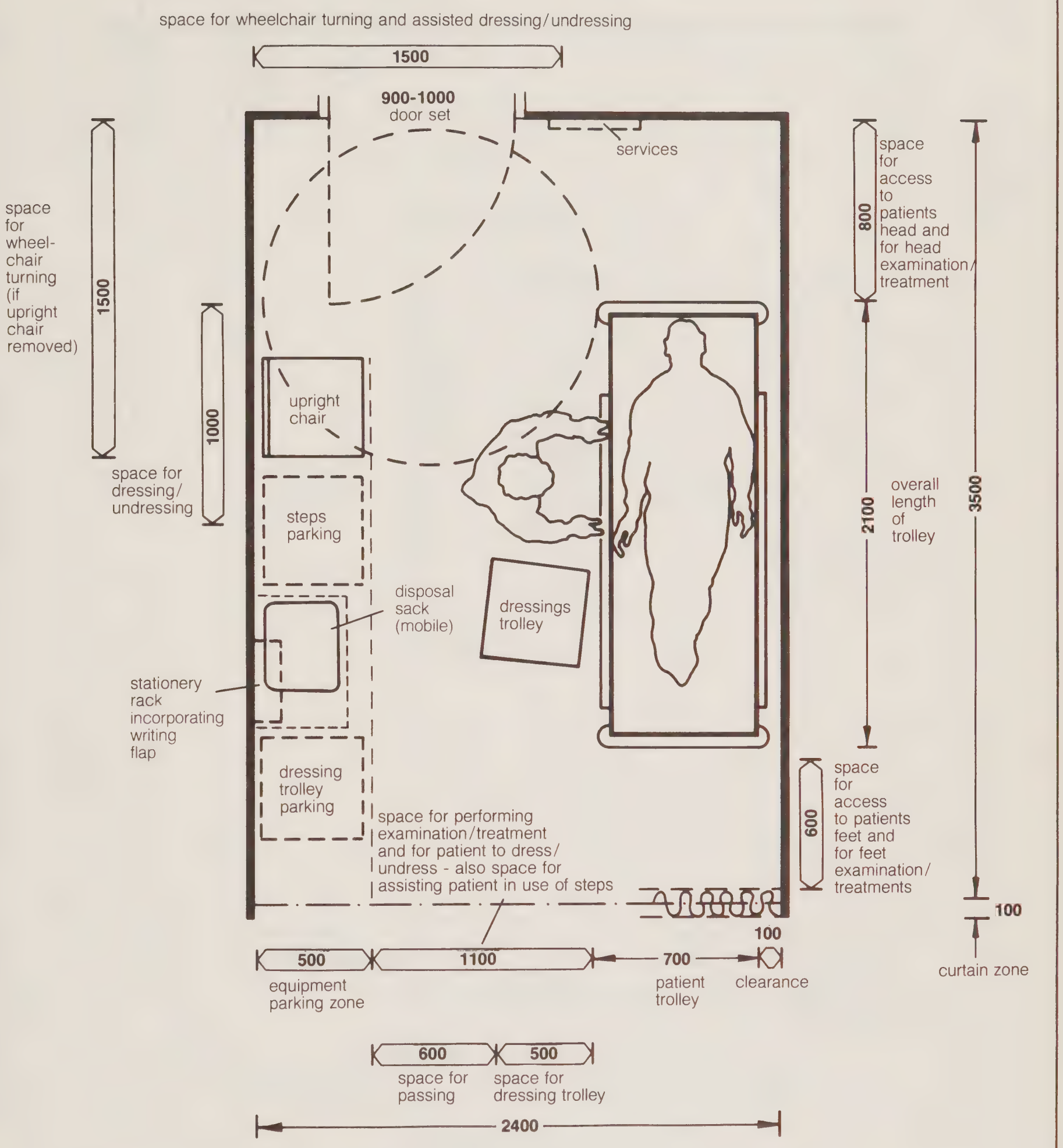
Activities:
Facilities for carrying out clinical examinations and treatments of patients who are either sitting in a chair pf wheelchair, or lying on a trolley. The patient occasionally has to undress. Normally examination/treatment will be performed by 1-2 staff, who, when the patient is lying on the trolley, will work mainly from the left hand side. Also facilities for recording patient data and storage of dressings etc. either on the dressings trolley or elsewhere and disposal of soiled dressings should be provided.

DHSS **Ergonomic data bank:**
Component-user data sheet not to scale

Examination/ Treatment Cubicle

Accident & Emergency

Users:
Ambulant/Wheelchair



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:
1. If patient is to be examined/treated in wheelchair, rather than being transferred to the trolley, the upright chair can be removed or parked elsewhere to give sufficient space for examination/treatment.

2. The use of a variable height couch/trolley would eliminate the need to provide steps for couch mounting.

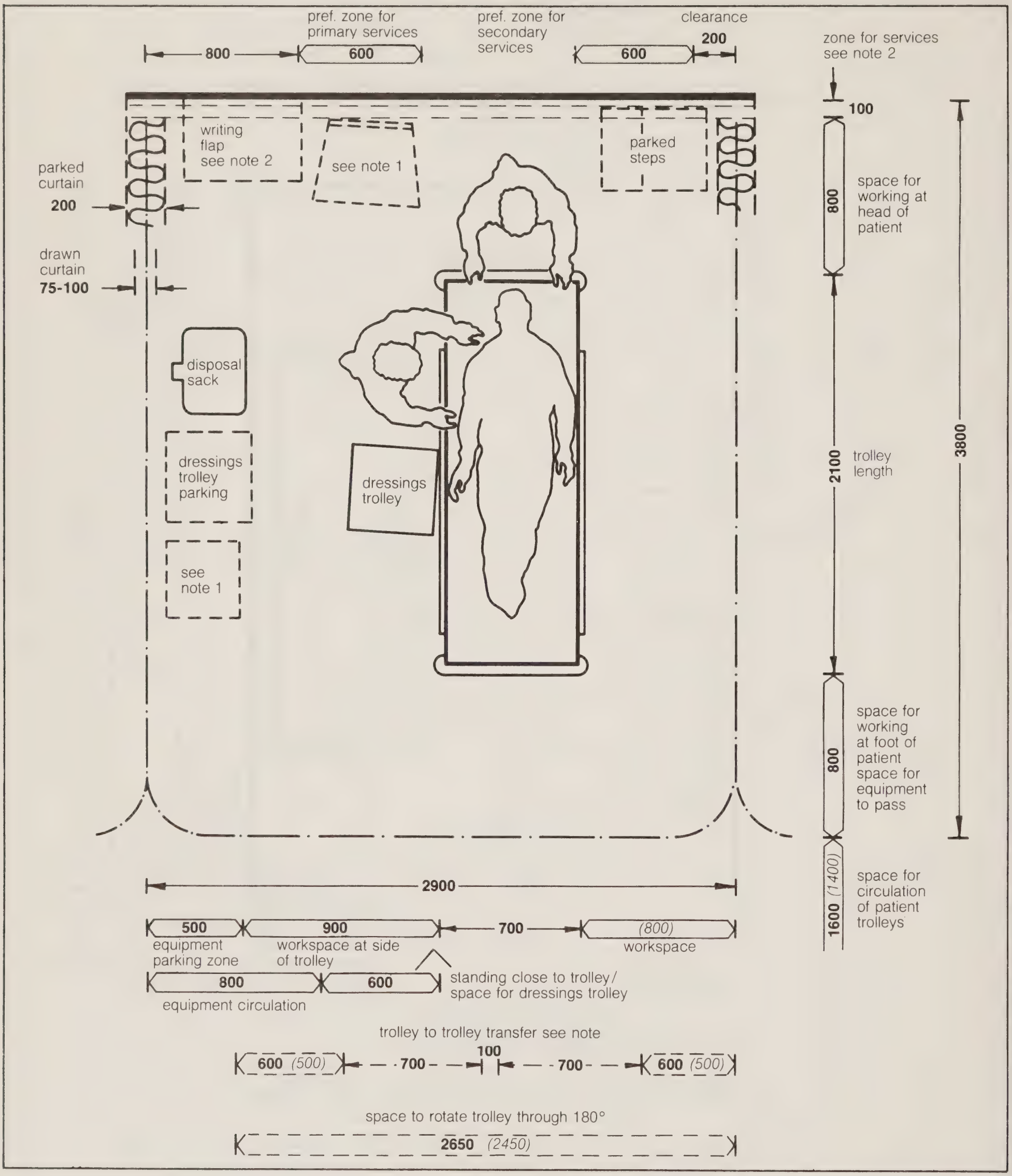
Activities
Facilities for carrying out clinical examinations and emergency medical and nursing procedures. The patient will be transported into the cubicle on an accident trolley but may occasionally be transferred from a wheelchair. Procedures will be performed by 1-4 staff who will carry them out from either side or end of the trolley. Facilities for recording patient data and disposal of soiled dressing should be provided (see also note 1).

DHSS **Ergonomic data bank:**
Component user data sheet, not to scale

Examination/ Treatment Cubicle

Accident & Emergency

Users:
Ambulant/Wheelchair



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:
1. Clinical handwashing will take place at a shared facility. A mobile Xray illuminator may be brought into the cubicle when necessary. Similarly, upright chair, stool and other portable equipment should be stored elsewhere and brought into the cubicle when required, otherwise they may impede efficient movement within the cubicle.

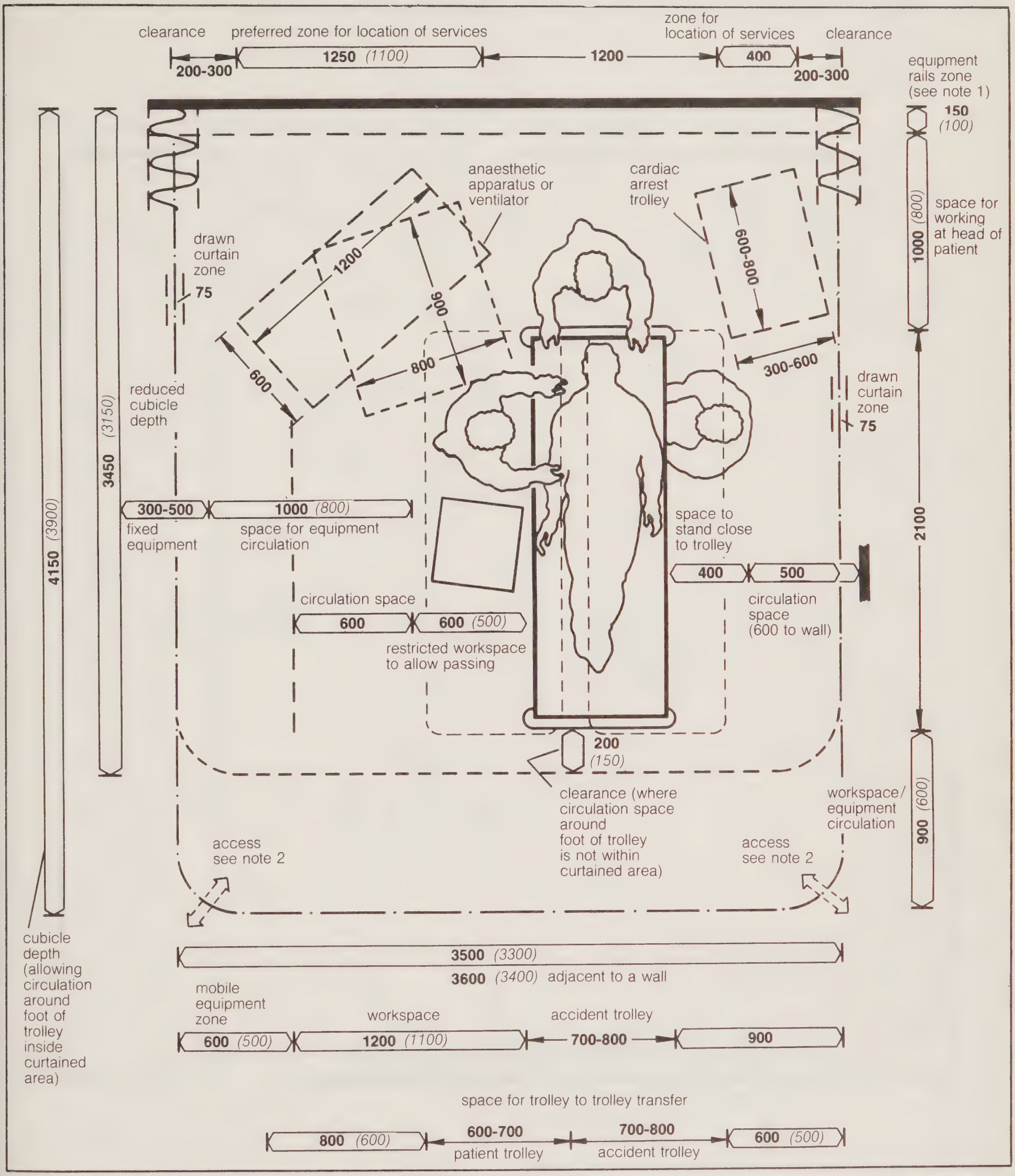
2. Heights above floor level for equipment rails 600, 1100, 1650, (1700 max) where service outlets are at 1350. (Writing flap may be fixed to second rail).

Activities
Facilities for performing resuscitation procedures.

Resuscitation Cubicle

Accident & Emergency

DHSS **Ergonomic data bank:**
Component-user data sheet not to scale



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Equipment rail space allowance must preferably accommodate the small fixed items which can occur immediately behind the patient trolley. *(100)* Space shown refers to the space for rail only. Large items fixed to the rail such as trays, must be positioned where they do not impede circulation around patient trolley.

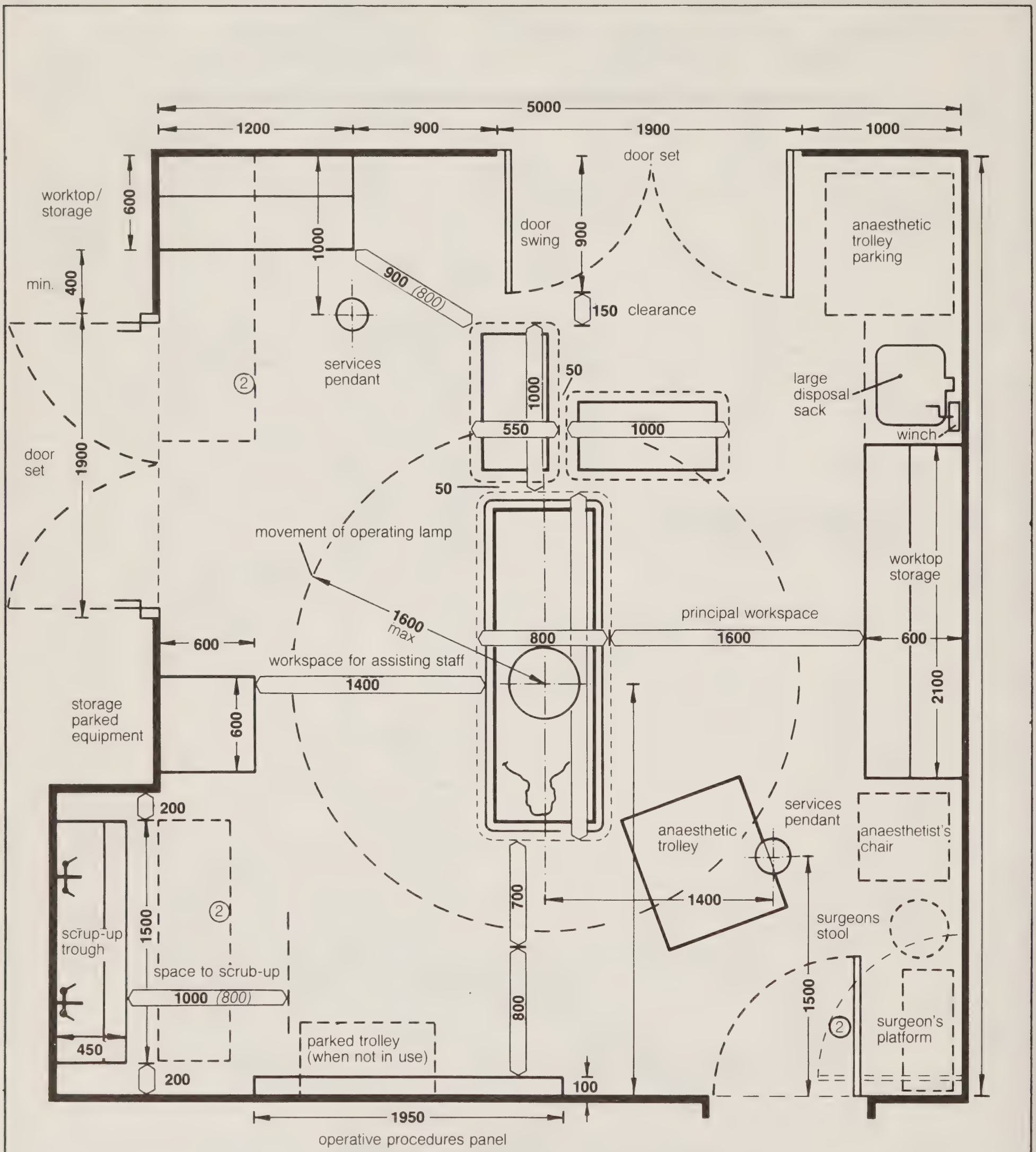
2. Curtains must be arranged (eg in 3 adjacent cubicles) so as to allow unobstructed access at the external corners of the cubicle.

Activities
Facilities for performing minor operative procedures and reduction of fractures, including the application of plaster under local or general anaesthetic not requiring full facilities of an operating dept.

DHSS **Ergonomic data bank:**
Component-user data sheet not to scale

Major Treatment Room

Accident & Emergency

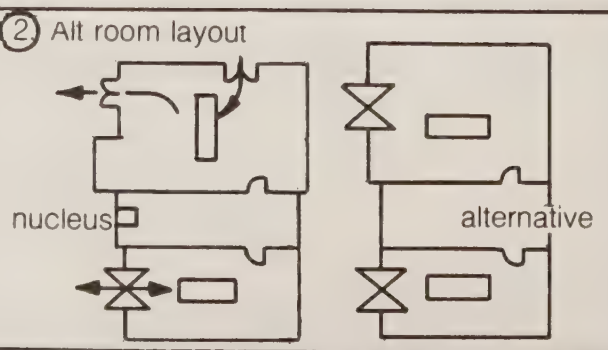


1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:
1. Ceiling mounted service pendants are preferred, but must be designed and located so as to minimise possible injury to taller staff or damage mobile equipment. They should not be located in direct line with access doors and should preferably not be rigid, have sharp corners or hard elements which are unprotected. Some compromise between positioning pendants and avoidance of restriction of operating lamp may also be required.

(2) Alt room layout

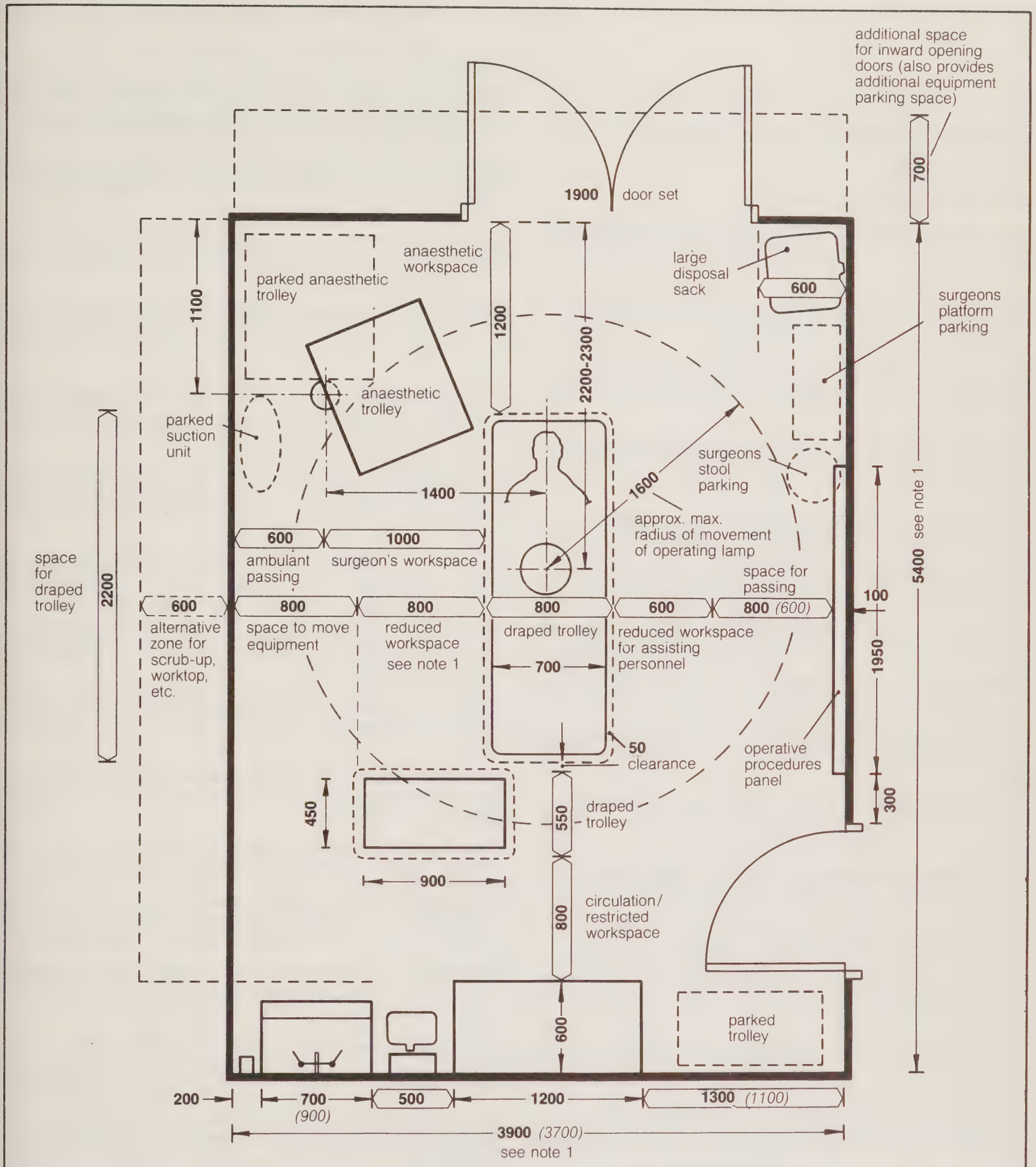


Activities
Facilities for performing minor operative procedures

Treatment Room 2

Accident & Emergency

DHSS **Ergonomic data bank:**
Activity space data sheet, not to scale



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:
1. Room length may be reduced to 5200 *(5000)* where draped instrument trolley is not parked at foot of accident trolley ie space of foot of accident trolley can be reduced to 1200 *(1000)*. However overall space at left hand side of accident trolley should be increased to 1900 *(1800)*

2. Restricted dimension shown may be acceptable where amenities at end of room are located down left hand side of room.

Bibliography

(not including detailed engineering references, which are given at the end of Chapter 6)

Chronically Sick and Disabled Persons Act, 1970

Chronically Sick and Disabled Persons (Amendment) Act, 1976

Disabled Persons Act, 1981

Building Regulations, 1985, Schedule 2

Department of Health and Social Security and Welsh Office. Radiodiagnostic department. (Health Building Note 6). London, HMSO, 1985. 75pp.

Department of Health and Social Security and Welsh Office. Common Activity Spaces. (Health Building Note 40, Volume 1. Example layouts: Common components). HMSO, 1986. 138pp.

Department of Health and Social Security and Welsh Office. Common Activity Spaces. (Health Building Note 40, Volume 2. Corridors). HMSO, 1986. 100pp.

Department of Health and Social Security and Welsh Office. Staff changing and storage of uniforms. (Health Building Note 41). London, HMSO, 1984. 33pp.

Department of Health and Social Security and Welsh Office. External works for health buildings. (Health Building Note 45) (in preparation).

Department of Health and Social Security and Welsh Office. Windows. (Health Technical Memorandum 55). London, DHSS, 1985. 21pp.

Department of Health and Social Security and Welsh Office. Partitions. (Health Technical Memorandum 56). London, DHSS, 1986. 43pp.

Department of Health and Social Security and Welsh Office. Internal glazing. (Health Technical Memorandum 57). London, DHSS, 1986. 13pp.

Department of Health and Social Security and Welsh Office. Internal doorsets. (Health Technical Memorandum 58). London, DHSS, 1986. 29pp.

Department of Health and Social Security and Welsh Office. Ironmongery. (Health Technical Memorandum 59). London, DHSS, 1986. 37pp.

Department of Health and Social Security and Welsh Office. Ceilings. (Health Technical Memorandum 60). London, DHSS, 1985. 29pp.

Department of Health and Social Security and Welsh Office. Flooring. (Health Technical Memorandum 61). London, DHSS, 1985. 42pp.

Department of Health and Social Security and Welsh Office. Demountable storage system. (Health Technical Memorandum 62). London, DHSS, 1986. 32pp.

Department of Health and Social Security and Welsh Office. Fitted storage system. (Health Technical Memorandum 63). London, DHSS, 1986. 32pp.

Department of Health and Social Security and Welsh Office. Sanitary assemblies. (Health Technical Memorandum 64). London, DHSS, 1985. 64pp.

Department of Health and Social Security and Welsh Office. Signs. (Health Technical Memorandum 65). London, HMSO, 1984. 92pp.

Department of Health and Social Security and Welsh Office. Cubicle curtain track. (Health Technical Memorandum 66). London, DHSS, 1986, 5pp.

Department of Health and Social Security and Welsh Office. FIRECODE: Fire precautions in new hospitals. (Health Technical Memorandum 81). HMSO, 1987.

Department of Health and Social Security and Welsh Office. FIRECODE: Fire alarm and detection systems. (Health Technical Memorandum 82). HMSO, 1982, 53pp (Under review).

Department of Health and Social Security and Welsh Office. FIRECODE: General fire precautions. (Health Technical Memorandum 83). HMSO, 1982, 26pp (Under review).

Department of Health and Social Security and Welsh Office. FIRECODE: Assessing fire risks in existing hospital wards. (Health Technical Memorandum 86). HMSO, 1987.

Department of Health and Social Security and Welsh Office. Fire safety in health care premises — furniture, furnishings, bed assemblies, apparel. (Health Technical Memorandum 87). HMSO, 1983. 20pp (Under review).

Department of Health and Social Security and Welsh Office. Pollution of operating departments by anaesthetic gases. (Health Circular HC(76)38). (In Wales, WHC(76)34). DHSS, 1976. 6pp.

Department of Health and Social Security and Welsh Office. Health Services Development. Health Service arrangements for dealing with major accidents. (Health Circular HC(77)1. (In Wales, WHC(77)10). DHSS, 1977.

Department of Health and Social Security and Welsh Office. Promoting non-smoking on NHS premises. (Health Circular HC(85)22). May 1985. (In Wales, Circular WHC(85)31. June 1985. 3pp.

Department of Health and Social Security. Health Services Management. Food hygiene and pest control in the Health Service. (Health Circular HC(86)14). November 1986.

Department of Health and Social Security and Welsh Office. Furniture Purchasing Advisory Group: soft floor coverings. (Circular HN(78)32). 1978.

National Association of Health Authorities. National Health Service Security Manual. Issued with Circular HN(84)26. December 1984. (In Wales, Circular WHN(85)1).

Department of Health and Social Security. Capricode — Health Building Procedures. Issued with HN(86)32. London, HMSO. 68pp.

Department of Health and Social Security. Ambulance service emergency conveyance of patients by air: arrangements for use of Service helicopters. (Health Service Circular HSC(IS)196). September 1975.

Department of Health and Social Security and Welsh Office. Upgrading and adaptation of existing buildings. (Works officer letter WKO(81)4). (In Wales, AWO(81)8). July 1981. 5pp.

Department of Health and Social Security and Welsh Office. Code of Practice for the storage of medical, pathology and industrial gas cylinders. (Works Officer Letter WKO(85)1). (In Wales, letter CAWO(85)1). 3pp.

Department of Health and Social Security and Welsh Office. Hospital building — Teaching hospital space requirements. (Dear Secretary Letter DS 65/74 and DS 86/74). (In Wales, HSD 3/57/1). DHSS, 1974. 10pp.

Department of Health and Social Security. Hospital Statistics. Form SH 3 Regional and National summaries for 1982. DHSS, 1984. 156pp.

Department of Health and Social Security. The use of resources in Accident and Emergency Departments. (Polytechnic of North London, Medical Architecture Research Unit. Final Report). DHSS, 1984.

Department of Health and Social Security. Guide to 'A' and 'B' Activity Data Sheets and their use in health building schemes. London, HMSO, 1980. 34pp.

British Standards Institution. BS 5810: 1979: Code of practice for access for the disabled to buildings. 16pp.

British Standards Institution. BS 5925: 1980. A code of practice for design of buildings. Ventilation principles and designing for natural ventilation. 28pp.

Expenditure Committee. Fourth report from the Expenditure Committee Session 1973–74. Accident and emergency services. (HC 115–I and 115–II). London, HMSO, 1974, 2 Vols.

Medical Architecture Research Unit, Polytechnic of North London. The use of resources in Accident and Emergency Departments. Final Report, DHSS Commission. 1984.

Chambers J and Johnson K. Predicting demand for accident and emergency services. *Community Medicine*, May 1986, Vol 8, No 2, pp 93–103.

Department of Health and Social Security. Works Guidance Index. DHSS, 1986. 266pp.

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